Canon Digital Retinal Camera – CR-2

Delighting You Always

Setting the benchmark for the future.

Less is more:
Less space. More flexibility

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Benefits and Features

1. **Perfection image reproduction with 15.1 megapixels.**
   - A dedicate camera back for Medical with excellent EOS technology.

2. **Small pupil mode.**
   - Pupil diameter as small as 3.3mm.

3. **Compact and lightweight.**
   - Now it weighs only 15.0Kg.

4. **Latest LED technology and low flash stereophotography.**
   - White LED replaces strobe tube.

5. **Digital filter technology for red-free and cobalt photography.**

6. **Automatic flash settings.**
   - Flash level is set automatically for every new examination.

7. **Anterior photography mode.**
   - New mode makes anterior segment photography quick and easy.

8. **Multifunctional joystick for reliable user control.**

9. **Reduced Maintenance.**

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CR-2 and CR-1 Mark II Comparison

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		CR-2	CR-1 Mark II	Remarks
Field angle		45° 36°(at ×2)	45° 36°(at ×2)	
Main unit	Digital camera	For medical equipment	EOS-50D	Direct mount
	Image size (on EOS sensor)	13.7 mm diameter (round)	14 mm diameter (round)	
Illumination	Observation	IRED LED	IRED LED	
	Photography	White LED	Xenon lamp	
Operability	Exposure compensation operation	Manual switch type	Manual switch type	Includes Low Flash mode
	Internal fixation lamp	Automatic/ Manual	Automatic/ Manual	
	Main unit up/down operation	Single-shaft joystick	Single-shaft joystick	
Other	External fixation lamp	Plug-in type	Plug-in type	Option
Capture software	Main unit communication	RICS NM (Ver. 3.X) *1	RICS NM (Ver. 2.X)	Unconnected operation is possible
	Image format	DICOM JPEG	DICOM JPEG	
	Compatible server	DICOM server	DICOM server	
	Compatible WorkFlow	DICOM worklist	DICOM worklist	
Chinrest		Motorized	Motorized	
Chinrest paper sheets		Replaceable	Replaceable	
TV monitor		VGA color monitor with high viewing angle	LCD color monitor	

Versus

	CR-2	CR-1 Mark II	Remarks
Required pupil diameter	4 mm or more 3.3 mm with SP function	4.2 mm or more 3.7 mm with SP function	
Dimensions (W × D × H) mm	305 × 500 × 473	320 × 530 × 550	
Weight (kg)	15.0	21.5	The CR-2 includes a digital camera
Standard flash intensity	ISO 1600	ISO 1600	
Low flash intensity	ISO 3200/6400	ISO 3200/6400	

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Specifications

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Specifications

Dimensions	305 W x 500 D x 473 H mm
Weight	15 kg (including digital camera 0.8 kg)
Angle of view	45°
Minimum pupil size	ø 4.0 mm (SP mode ø 3.3 mm)
Magnification	X2 (digital)
Photography modes	Colour / D-RF / D-Cobalt
Anterior segment photography	Equipped
Working distance	35 mm
Mounted camera	Dedicated digital camera unit using EOS camera technology

ISO (Standard)	1600
ISO (Low flash mode)	3200 / 6400
Flash intensity setting	Auto exposure
Focus adjustment	Split lines
Working distance adjustment	Working dots
Observation lamp	LED IRED
Photography lamp	LED White
Optional accessories	External Eye Fixation unit Chin rest paper: 500 sheets

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Camera Supported

Canon Medical EOS

- Infrared observation
- Colour fundus photography
- Digital red-free and cobalt fundus photography
- Dedicated firmware
- 15.1 MegaPixel

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Camera Supported

- Infrared cut filter is removed.
- Firmware is rewritten.
- External Labels are different

  -EOS logo, Strobo mark removed.

  -Rating label for Medical EOS.

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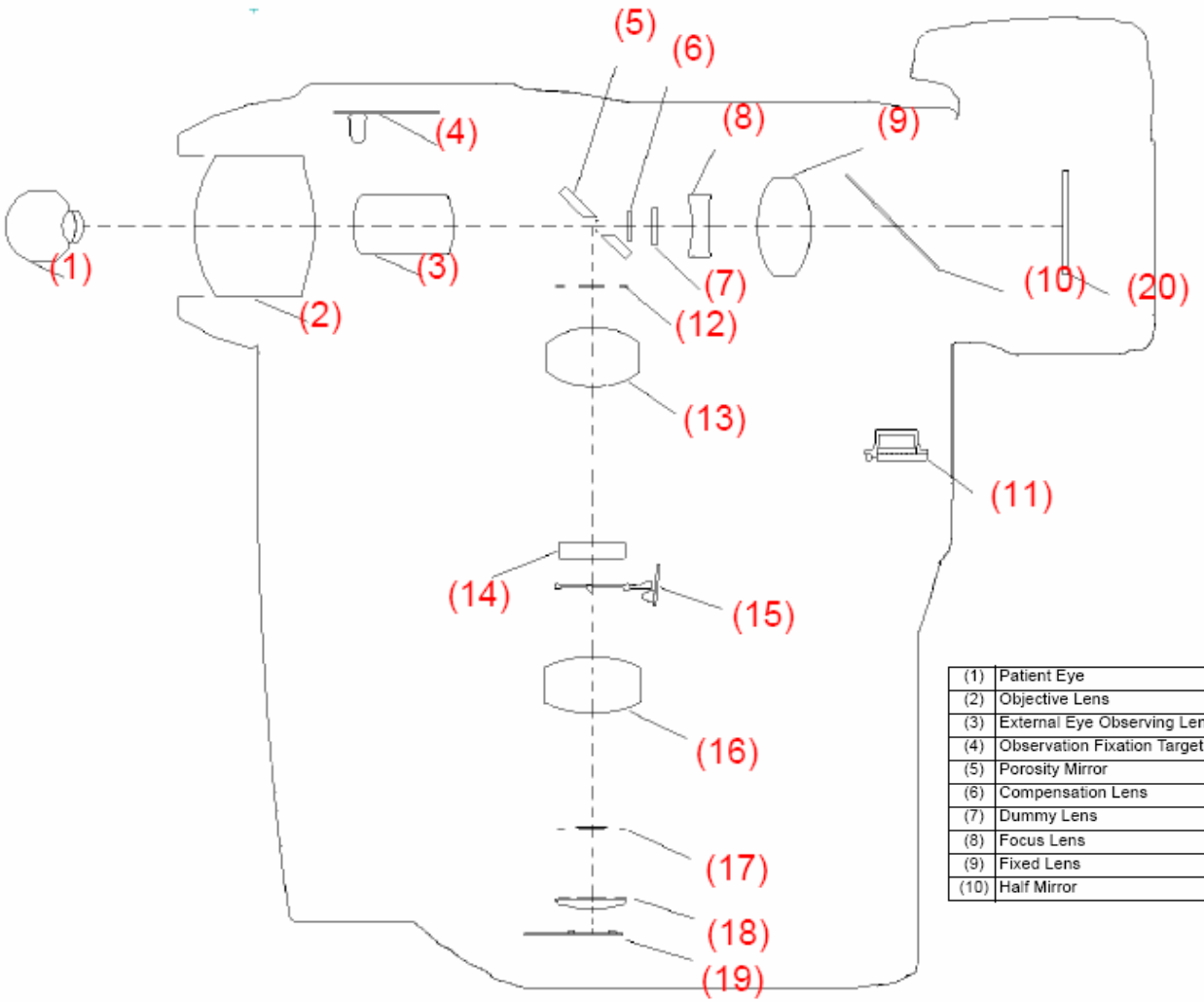
Optical Layout



(1)	Patient Eye	(11)	Internal Fixation LED
(2)	Objective Lens	(12)	Light Shield 2
(3)	External Eye Observing Lens	(13)	Upper Relay Lens
(4)	Observation Fixation Target	(14)	Black Spot
(5)	Porosity Mirror	(15)	Split Unit
(6)	Compensation Lens	(16)	Lower Relay Lens
(7)	Dummy Lens	(17)	Light Shield 1
(8)	Focus Lens	(18)	Ring Slit
(9)	Fixed Lens	(19)	Light Source
(10)	Half Mirror	(20)	Camera Sensor

Do you know the function of each component?

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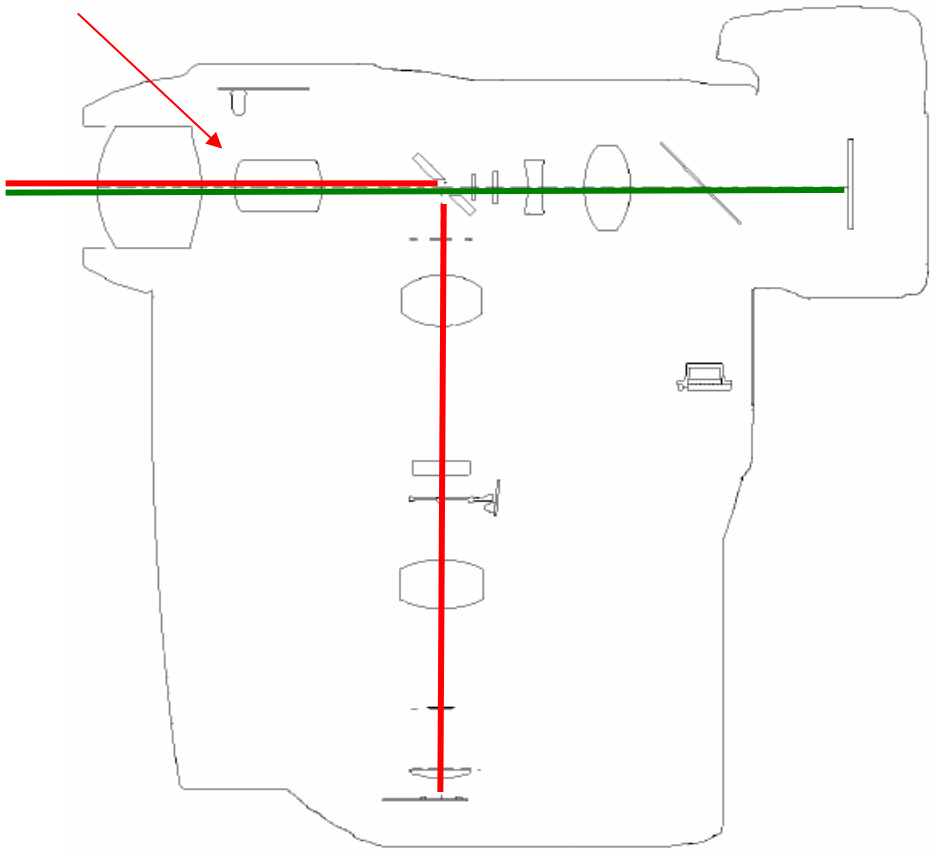
Imaging, Illumination and Observation Optical Path

In – Eye Observation
Out – Retina Observation



Towards Eye

Reflected from Eye

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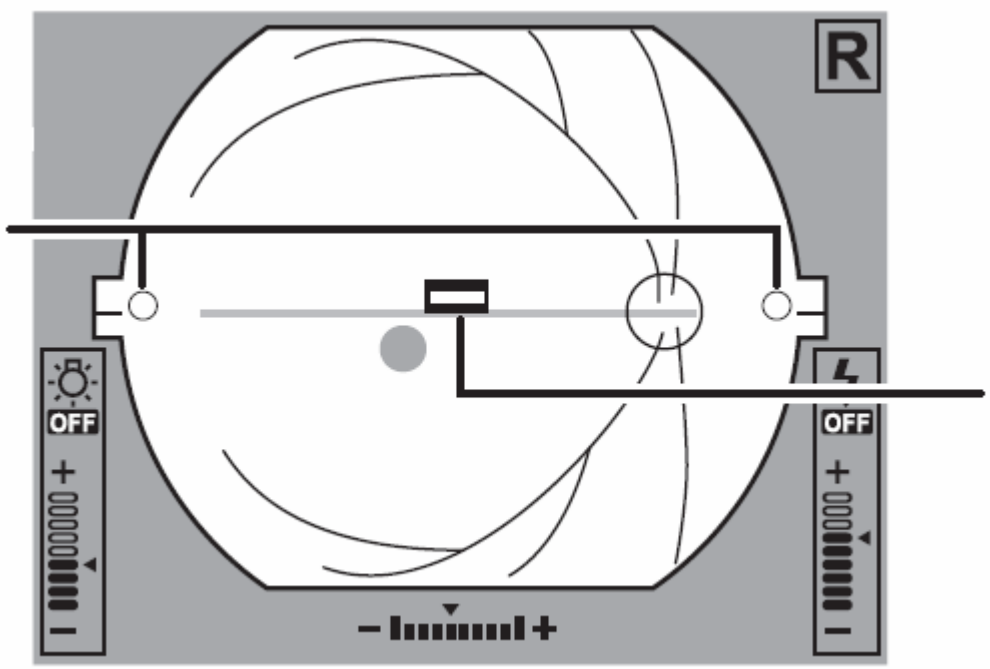
WD and Split Lines



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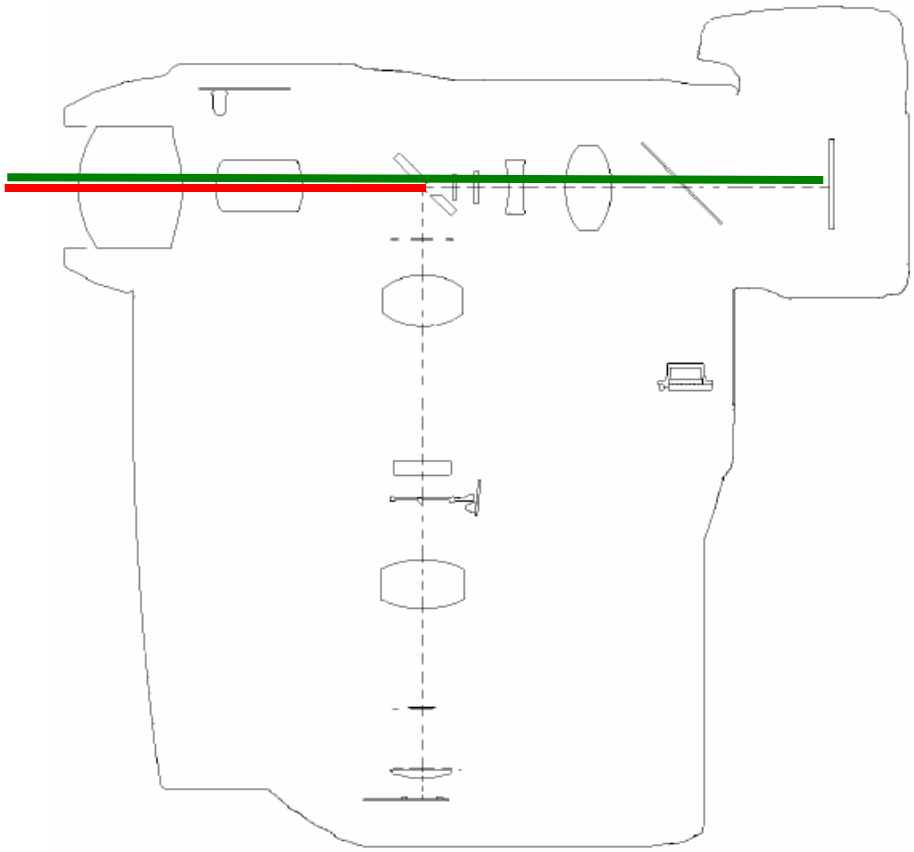
WD Dots (Working Distance)



Towards Eye

Reflected from Eye

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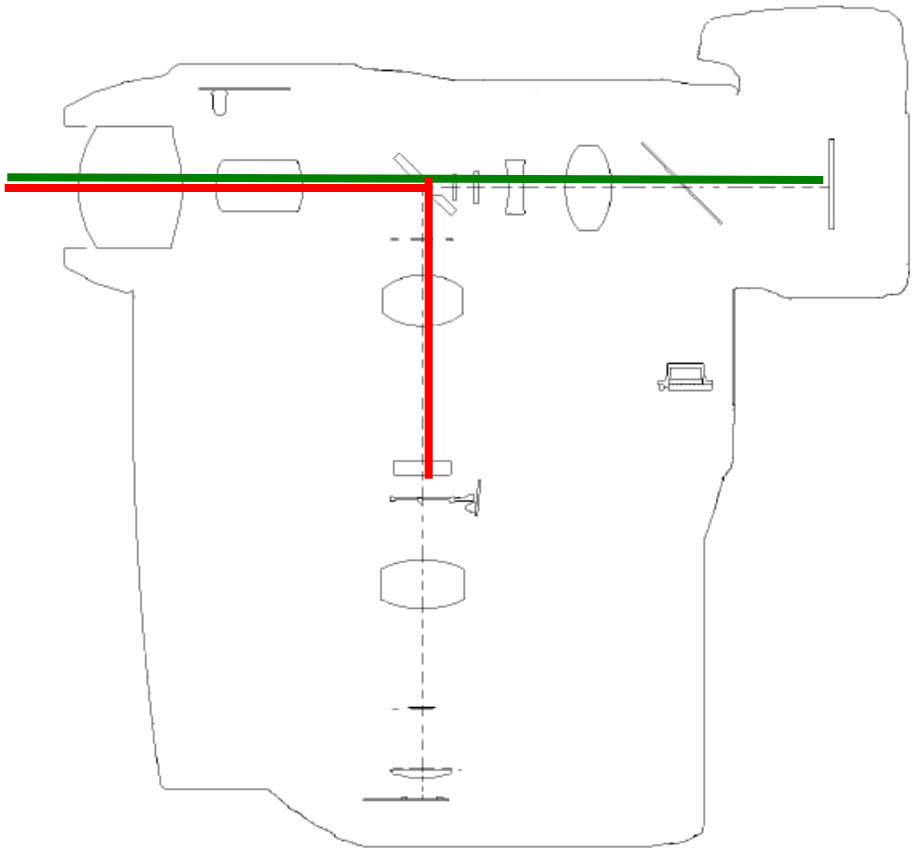
Split-Line Focusing



Towards Eye

Reflected from Eye

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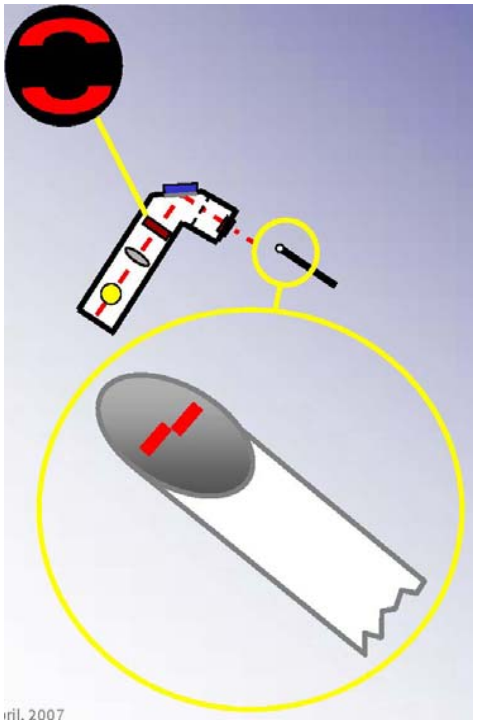
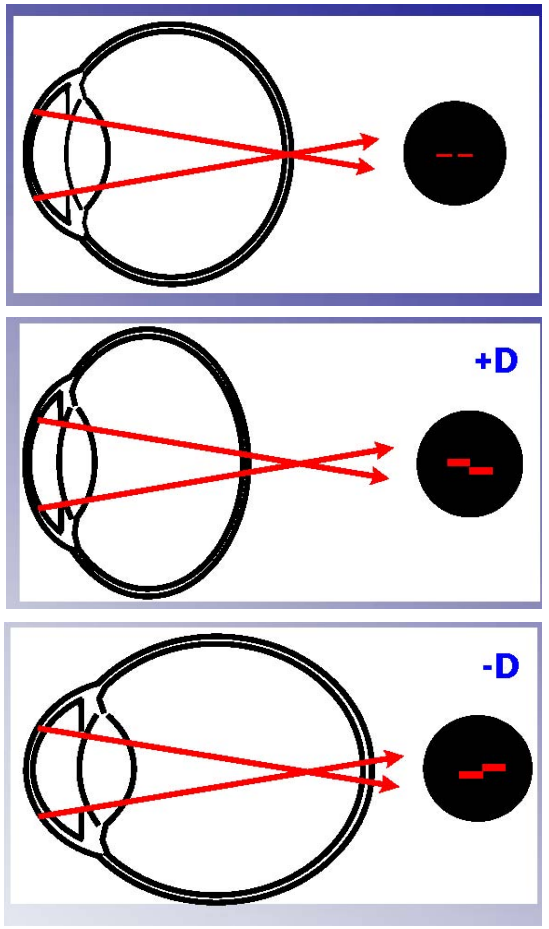
How does Split-Line Focusing work?





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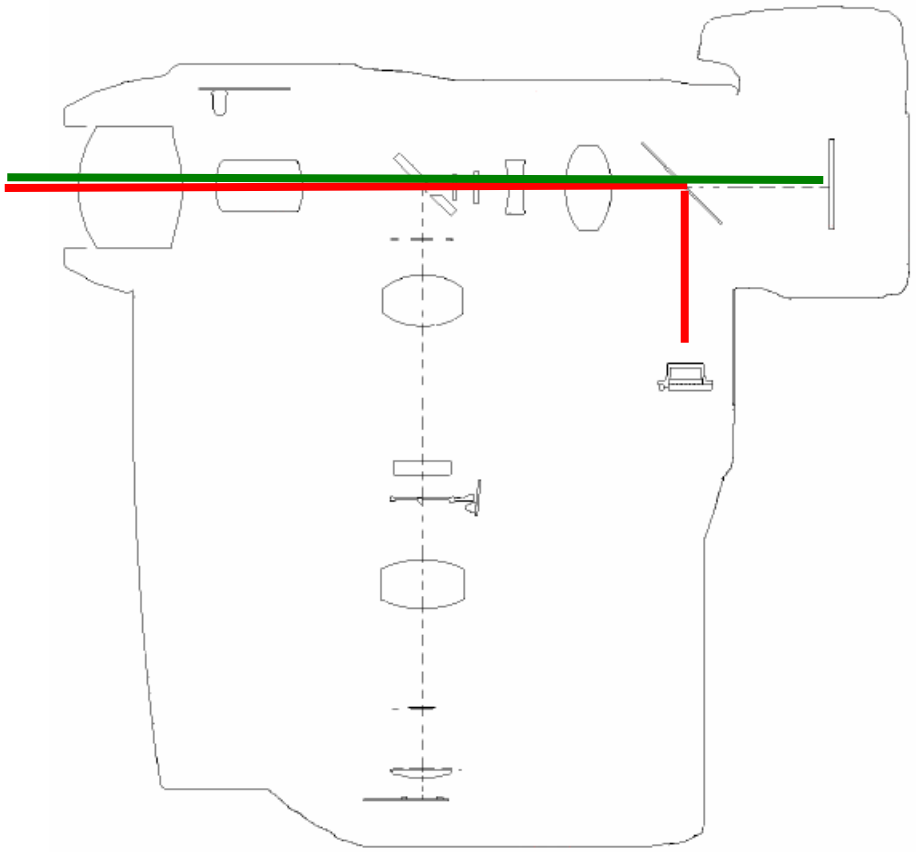
Internal Eye Fixation



Towards Eye

Reflected from Eye

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What is Ghost Image?

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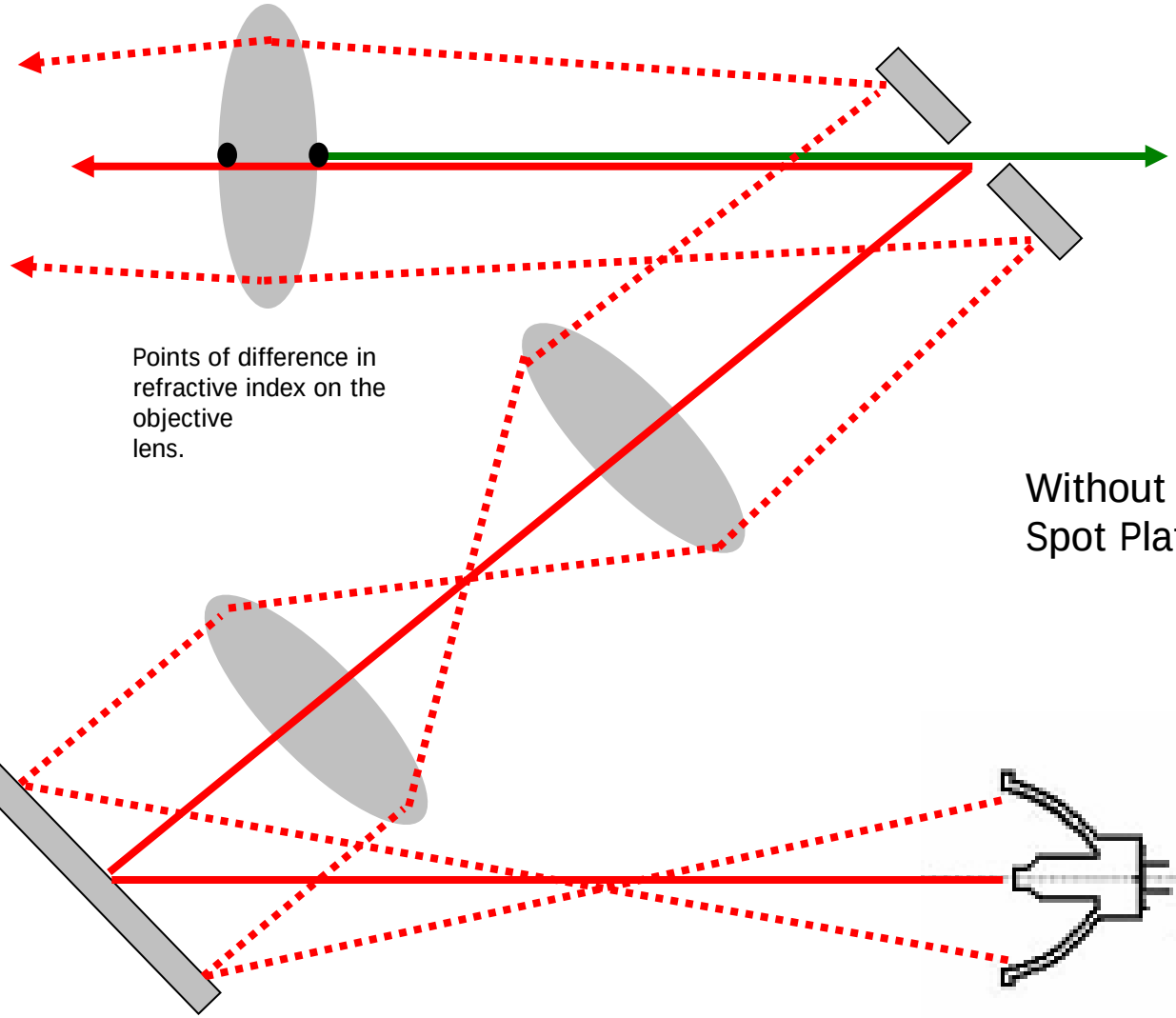
GHOST IMAGE
Points of difference in refractive index on the objective lens.
Without Black Spot Plate.
Towards Eye
Reflected from Eye

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What is Ghost Image?

Canon
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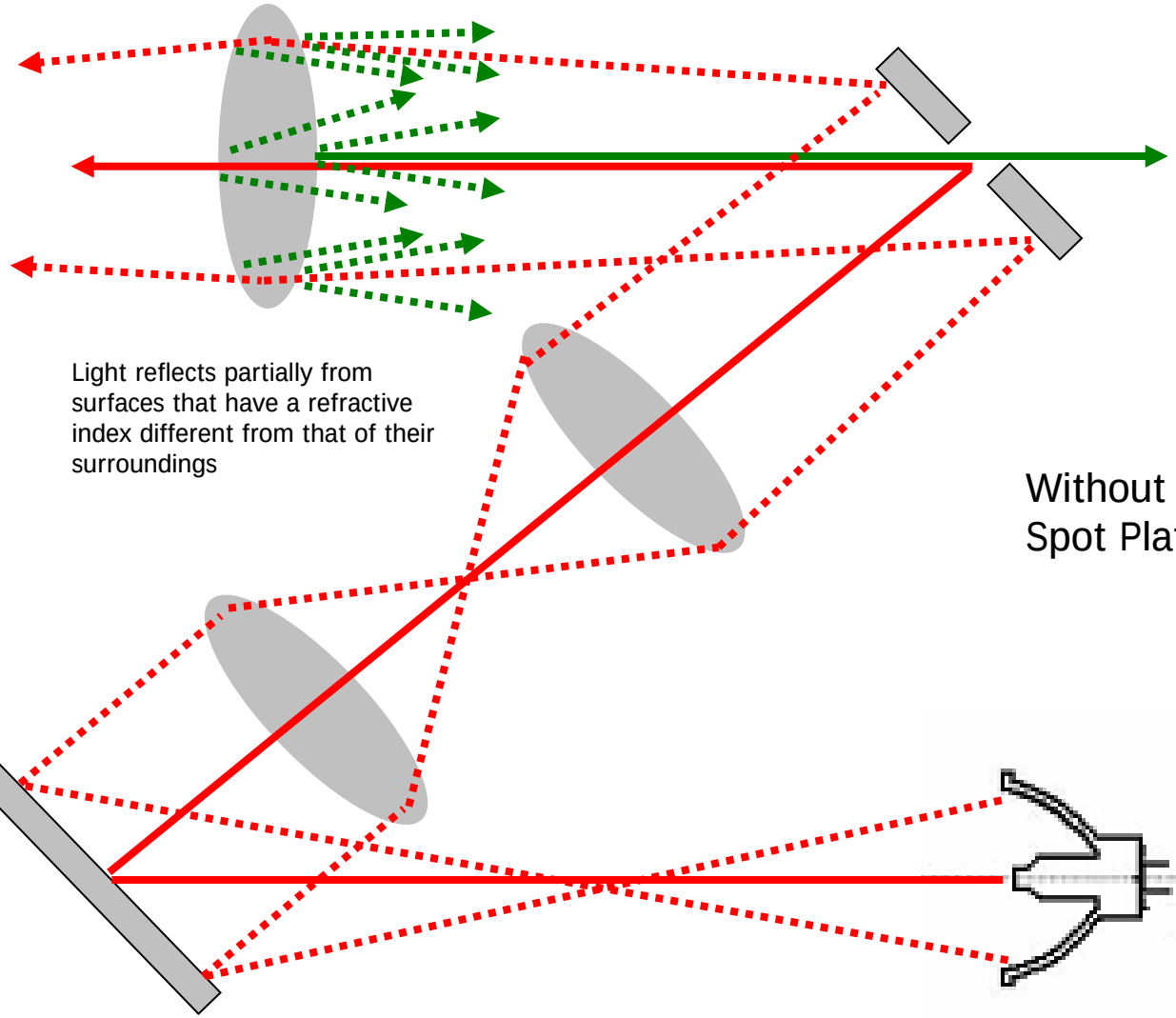
GHOST IMAGE
Light reflects partially from surfaces that have a refractive index different from that of their surroundings
Without Black Spot Plate.
Towards Eye
Reflected from Eye

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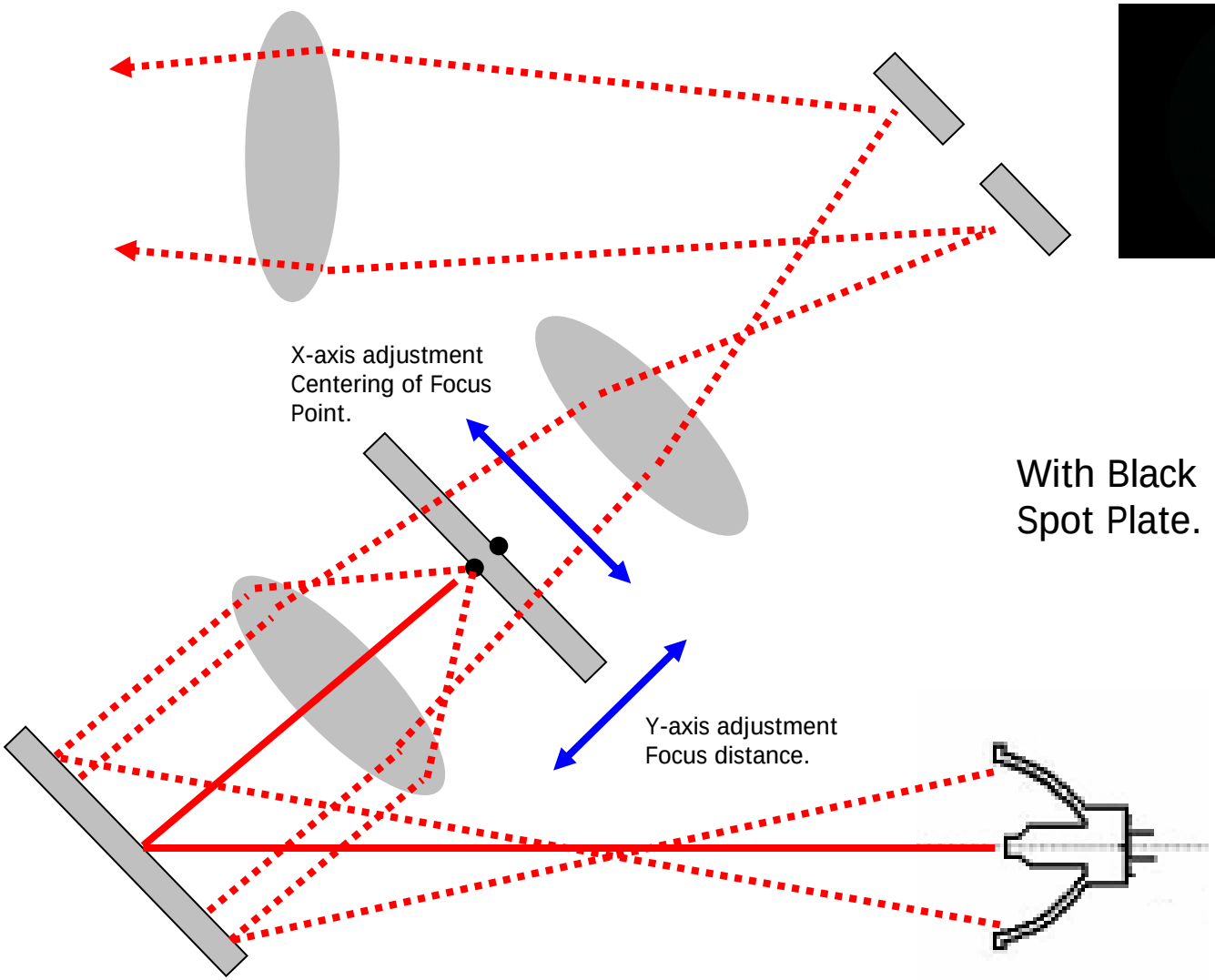
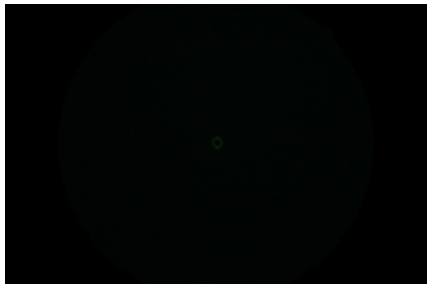
How is Ghost Image Eliminated?





With Black
Spot Plate.

Towards Eye

Reflected from
Eye

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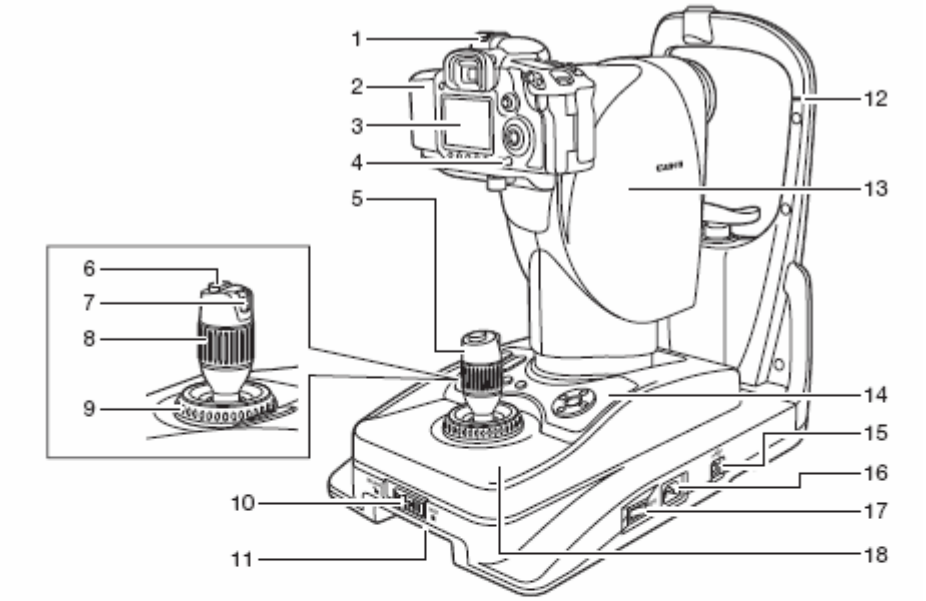
Operation – Unit Overview



1 Digital camera
2 Digital camera cover
3 Observation monitor
For viewing the anterior eye and retina.
4 Power switch for the digital camera
5 Operation lever
6 Shutter release button
7 Alignment button
Switches between a view of the anterior eye and the retina.
8 Main unit vertical movement ring
Turn right: Main unit moves up.
Turn left: Main unit moves down.
9 Focus ring
Turn to focus the image.
10 Stage lock
11 Indentation for lifting
12 Height adjustment mark
13 Main unit
14 Operation panel
15 USB connector
16 AC power connector
17 Power switch for main unit
18 Stage

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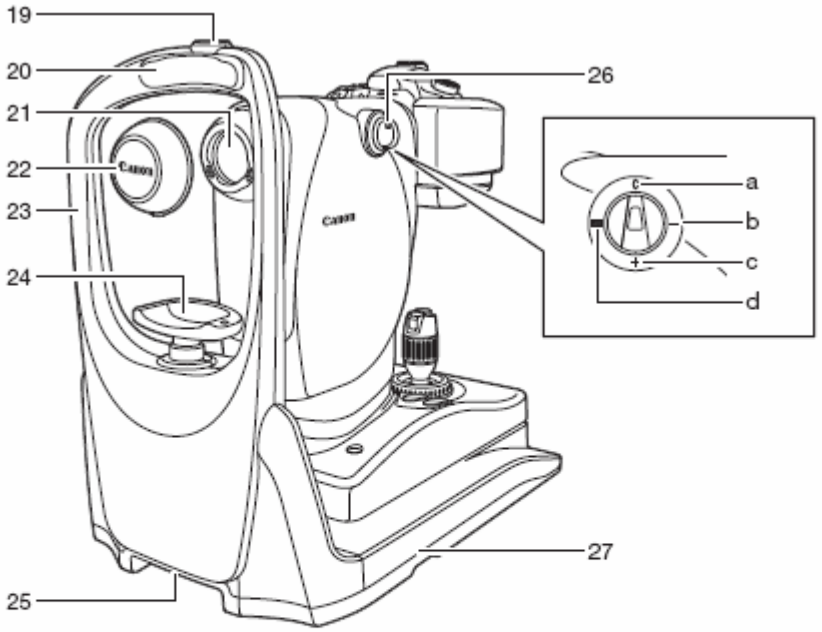
Operation – Unit Overview



19 Connector for external eye fixation lamp (with cap)
Connector for the external eye fixation lamp (sold separately).
20 Forehead rest
21 Objective lens
22 Objective lens cap
23 Face rest
24 Chin rest
25 Indentation for lifting
26 Diopter compensation knob
a No diopter compensation
b Negative compensation
c Positive compensation
d Anterior eye photography
27 Base

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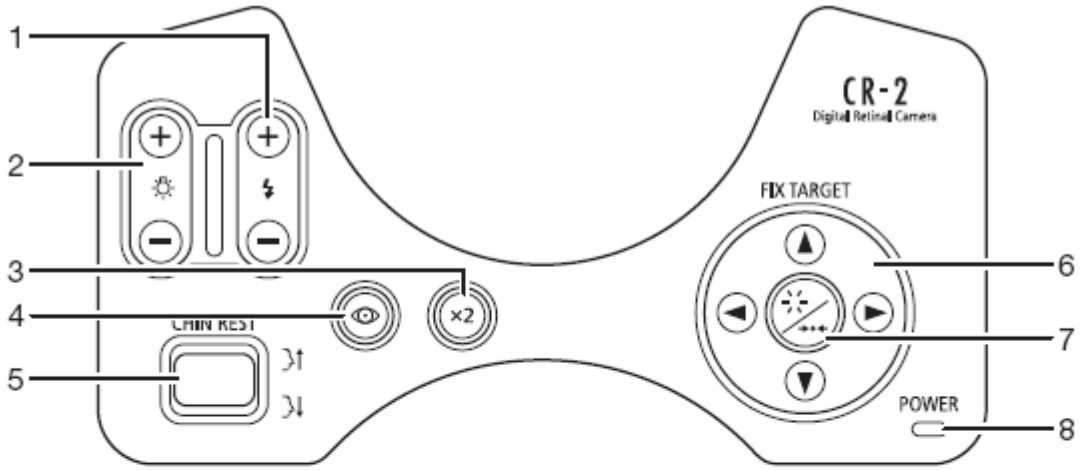
Operation – Unit Overview



1 Flash intensity button/lamp
+: Flash intensity increases.
–: Flash intensity decreases.

2 Observation light brightness button/lamp
+: Observation light brightness increases.
–: Observation light brightness decreases.

3 x2 photography button/lamp
Enables x2 photography function. (See page 30)

4 Small pupil photography button/lamp
Enables small pupil photography function. (See page 30)

5 CHIN REST button
Top: Raises chin rest.
Bottom: Lowers chin rest.

6 FIX TARGET button
Move up, down, right, and left to move internal eye fixation lamp.

7 Set button/lamp
Internal eye fixation lamp blinks.

8 POWER lamp
Lights when power is turned on.

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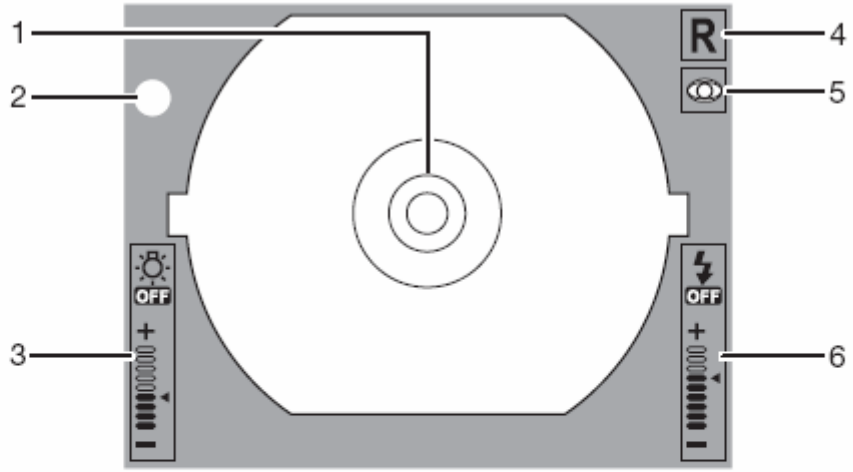
Operation – Unit Overview

During anterior eye observation



1 Pupil alignment circles

2 Photography ready lamp
Green: Ready to shoot
Red: Not ready to shoot

3 Observation light brightness indicator

4 Left/right eye indicator
R: Right eye
L: Left eye

5 Diopter compensation knob position indicator
: Anterior eye photography

6 Flash intensity indicator

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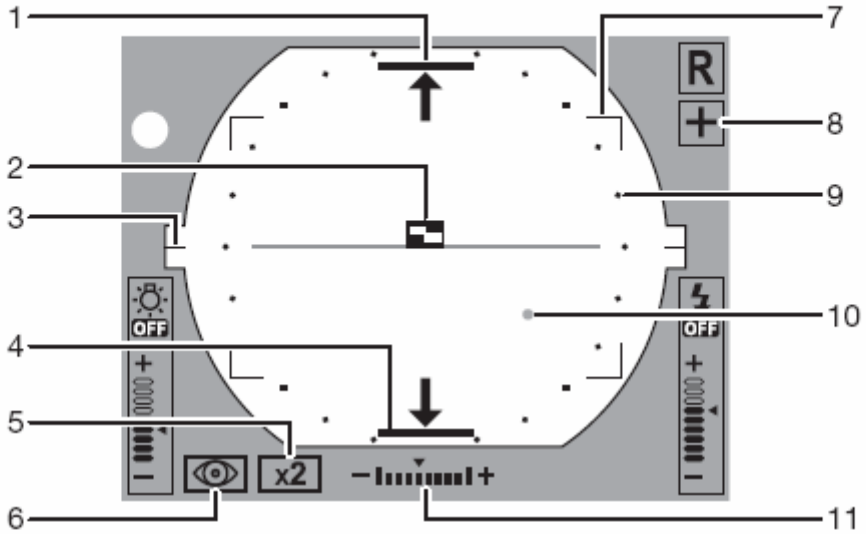
Operation – Unit Overview

During retinal observation (with x1.3 magnification)



1 Indicator for top limit of position of main unit
Appears when main unit has reached top limit.

2 Focus indicator

3 WD guide (green)

4 Indicator for bottom limit of position of main unit
Appears when main unit has reached bottom limit.

5 x2 photography indicator

6 Small pupil photography indicator

7 x2 photography range

8 Diopter compensation knob position indicator
None: No diopter compensation
+: Positive compensation
–: Negative compensation

9 Small pupil photography range

10 Internal eye fixation lamp position indicator

11 Focus lens position indicator

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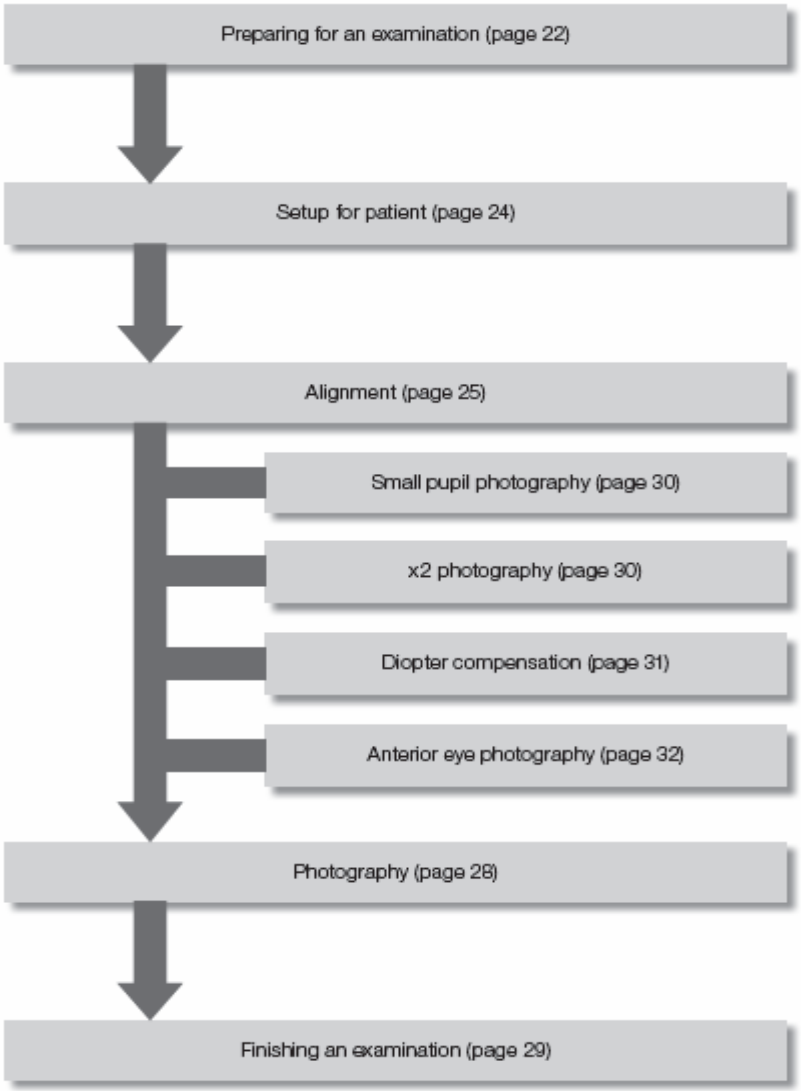
Operation – Work Flow


Preparing for an examination (page 22)
Setup for patient (page 24)
Alignment (page 25)
Small pupil photography (page 30)
x2 photography (page 30)
Diopter compensation (page 31)
Anterior eye photography (page 32)
Photography (page 28)
Finishing an examination (page 29)

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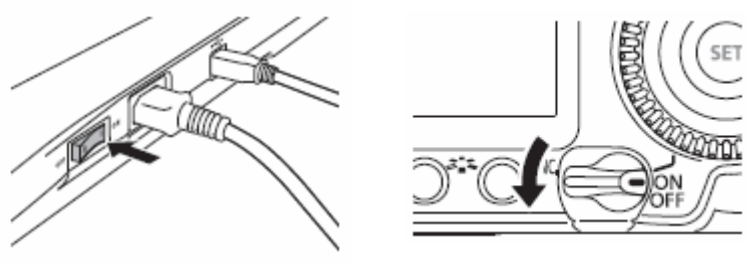
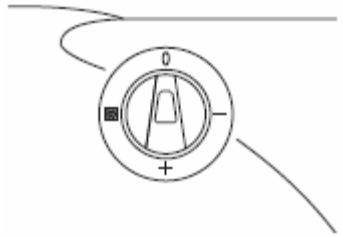
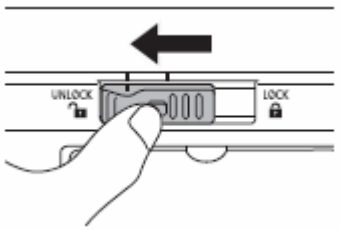
Operation - Prepare



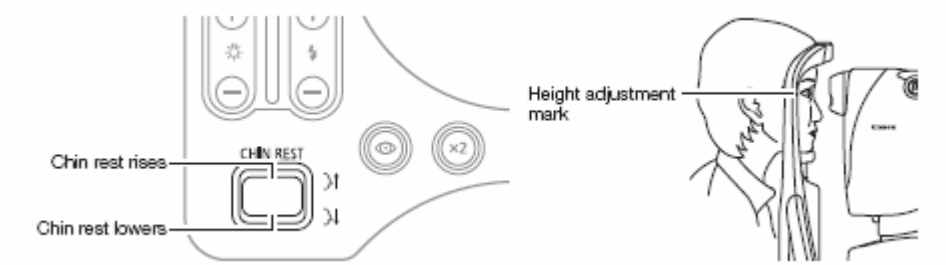
1) Switch On CR-2 and Medical EOS.



2) Select diopter compensation.



3) Unlock stage.



4) Adjust height.

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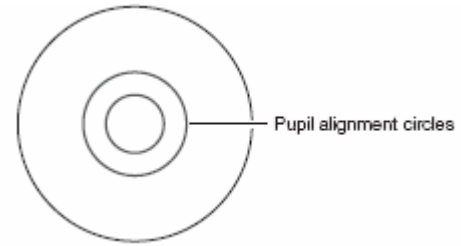
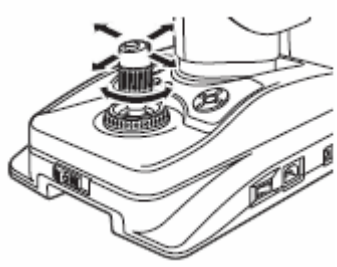
Operation - Adjust

5) Pull stage back.

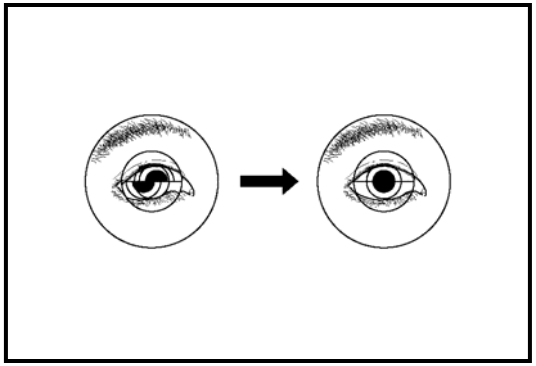
6) Prepare patient and align pupil.



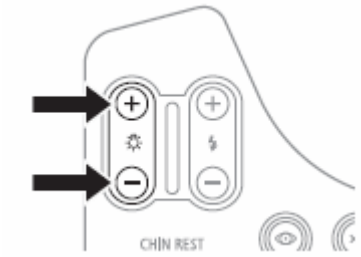
7) Adjust WD and field of view.



8) Check WD and field of view.



9) Improve illumination.



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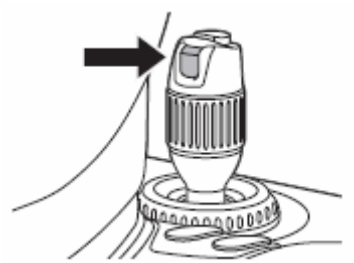
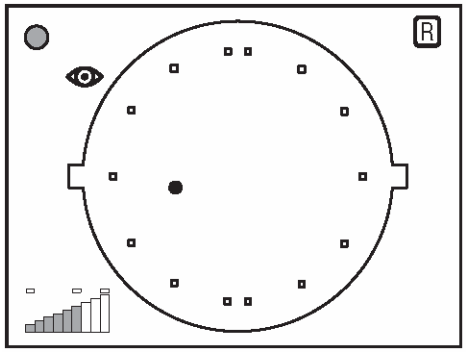
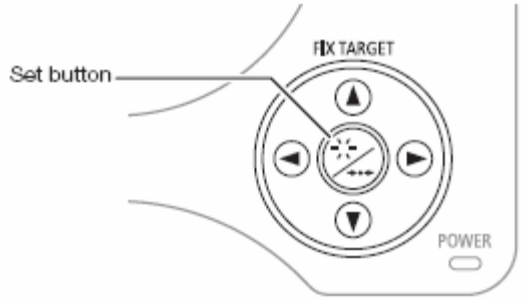
Operation - Adjust



10) Press Alignment.



11) Select Fixation. To reset fixation, press and hold ‘SET’ for more than 2 sec.



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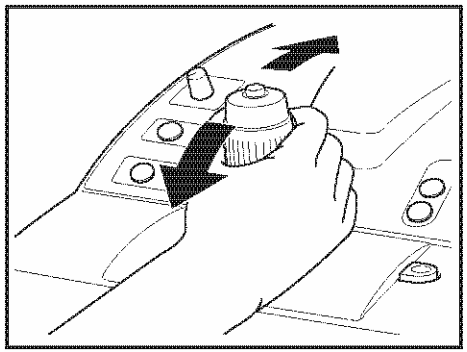
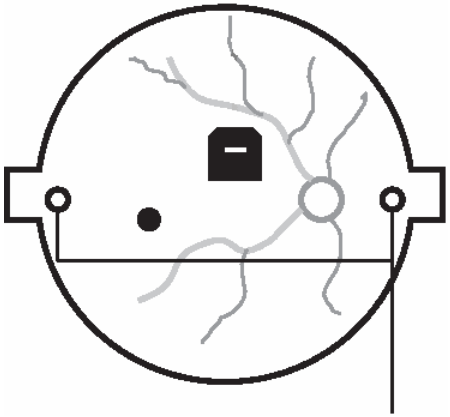
Operation – Move, Focus and Shoot



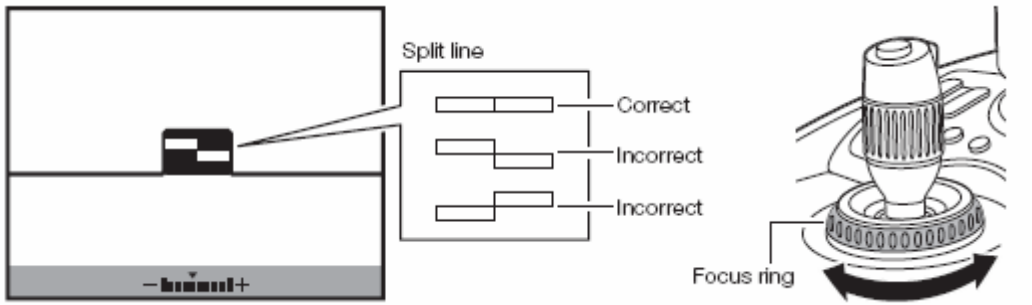
12a) Improve working distance.

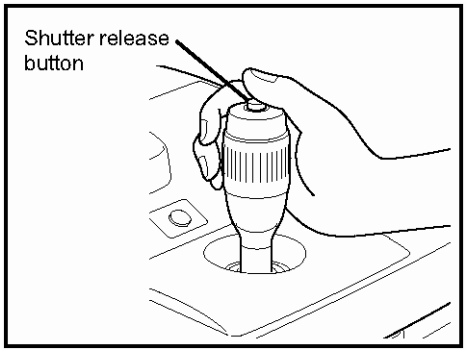


12b) WD dots appears sharp.

13) Check focus (Split bar not available in compensation) and WD dots.

13a) Split bar standard.





14) Shoot.

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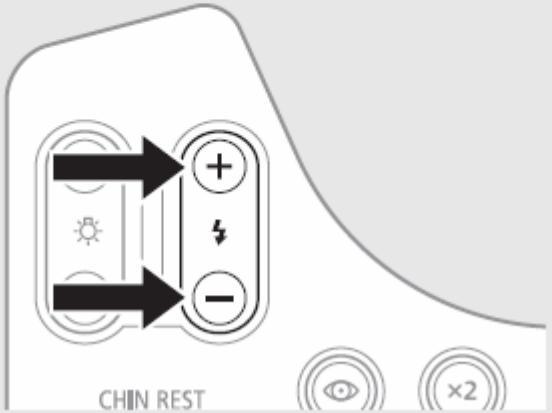
Operation – Flash Intensity and Ready Lamp

Photography ready lamp

- Green: Ready to shoot.
- Red: Preparing to shoot. Wait until the lamp lights green.
- None: Cannot access the Rics NM 2. The retina observation mode is not established.

Flash intensity adjustment

The flash intensity is set to the standard level in advance. Every time the flash intensity button is pressed the flash intensity increases by 0.3 stop.



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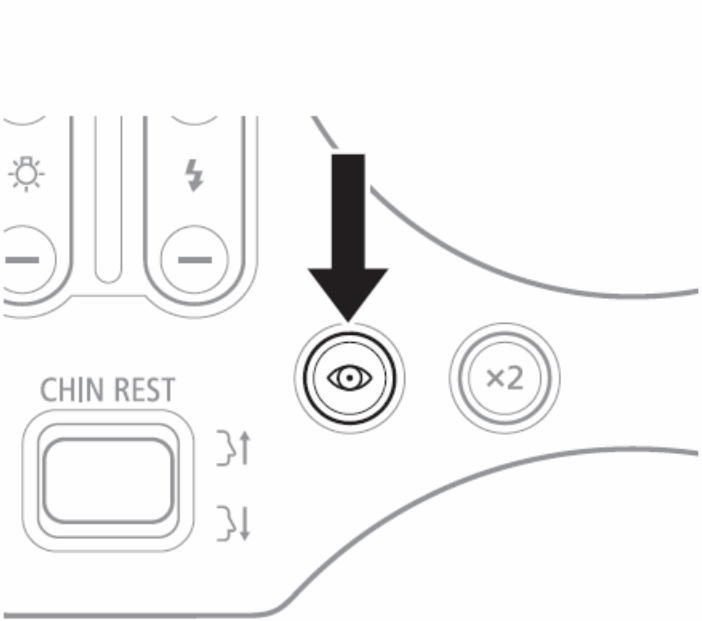
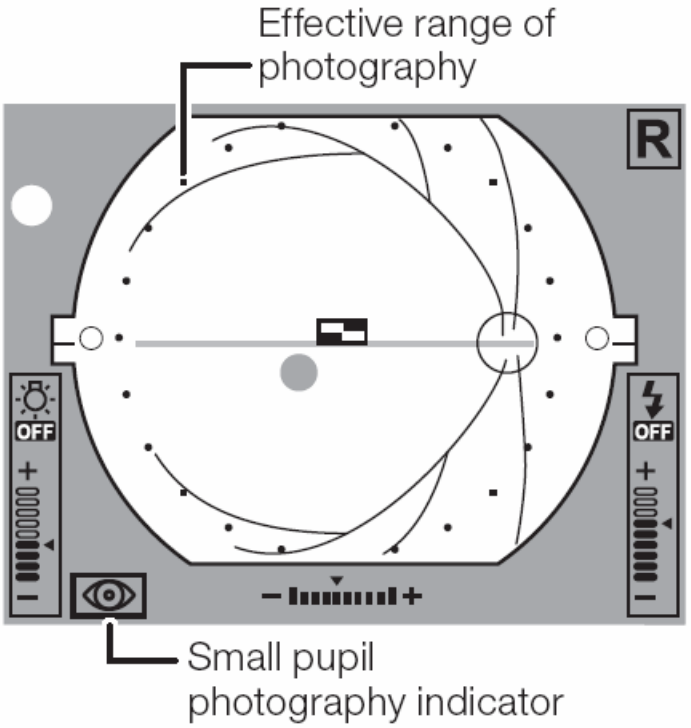
Operation – SP Function





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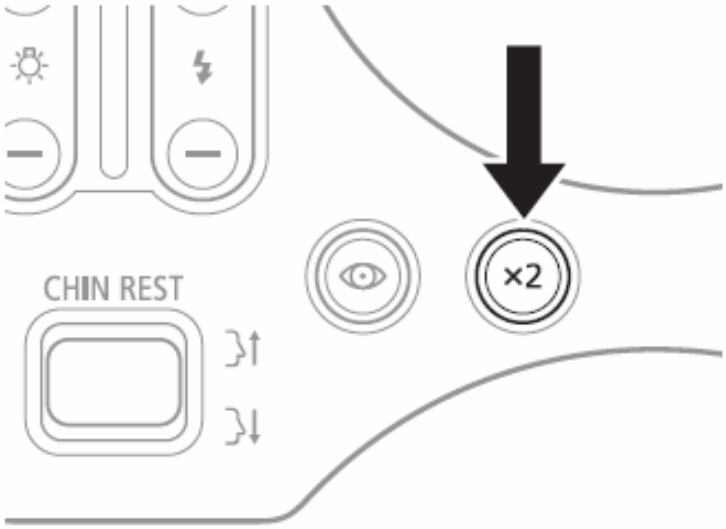
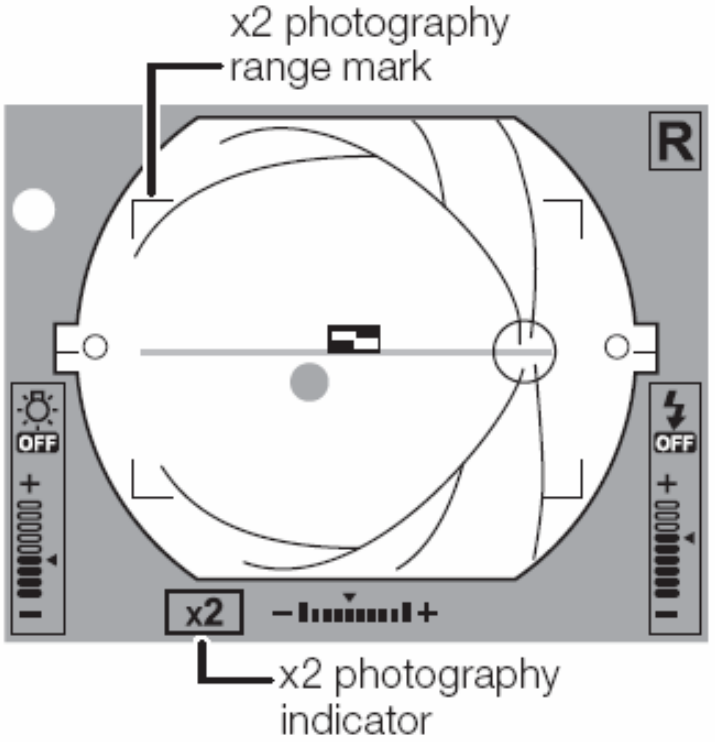
Operation – Zoom Function





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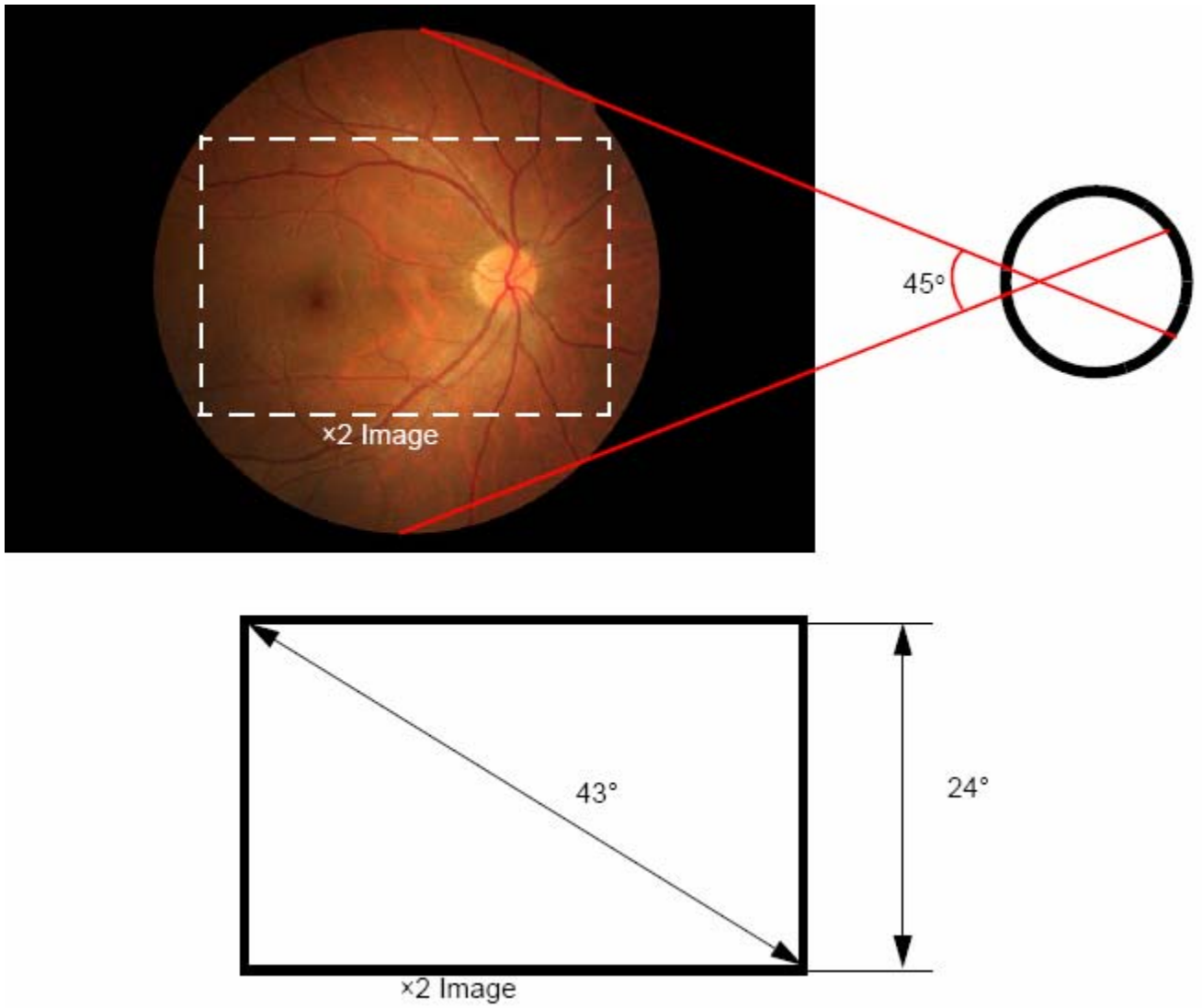
Operation – Zoom Function



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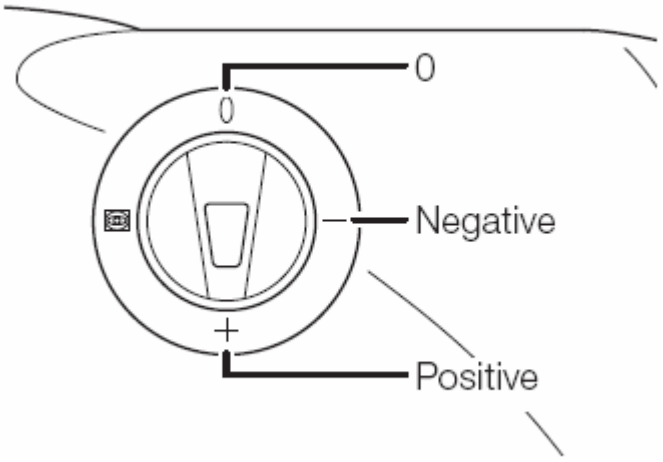
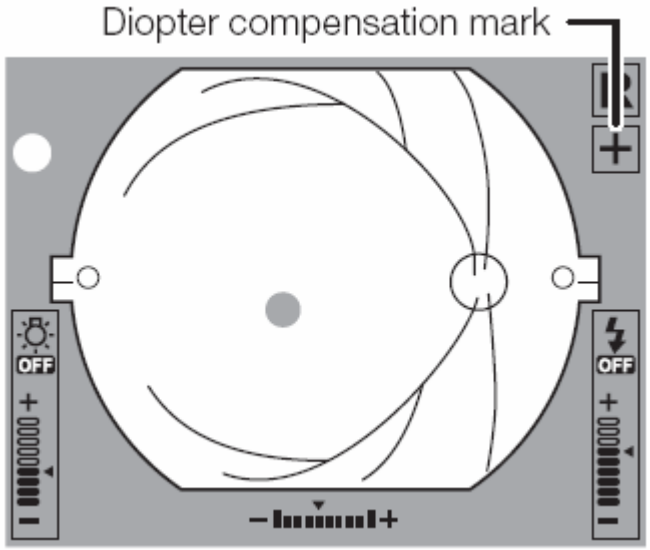
Operation – Diopter Compensation Function





- 0 position: –10 to +15 D
- – position: –31 to –7 D
- + position: +11 to +33 D

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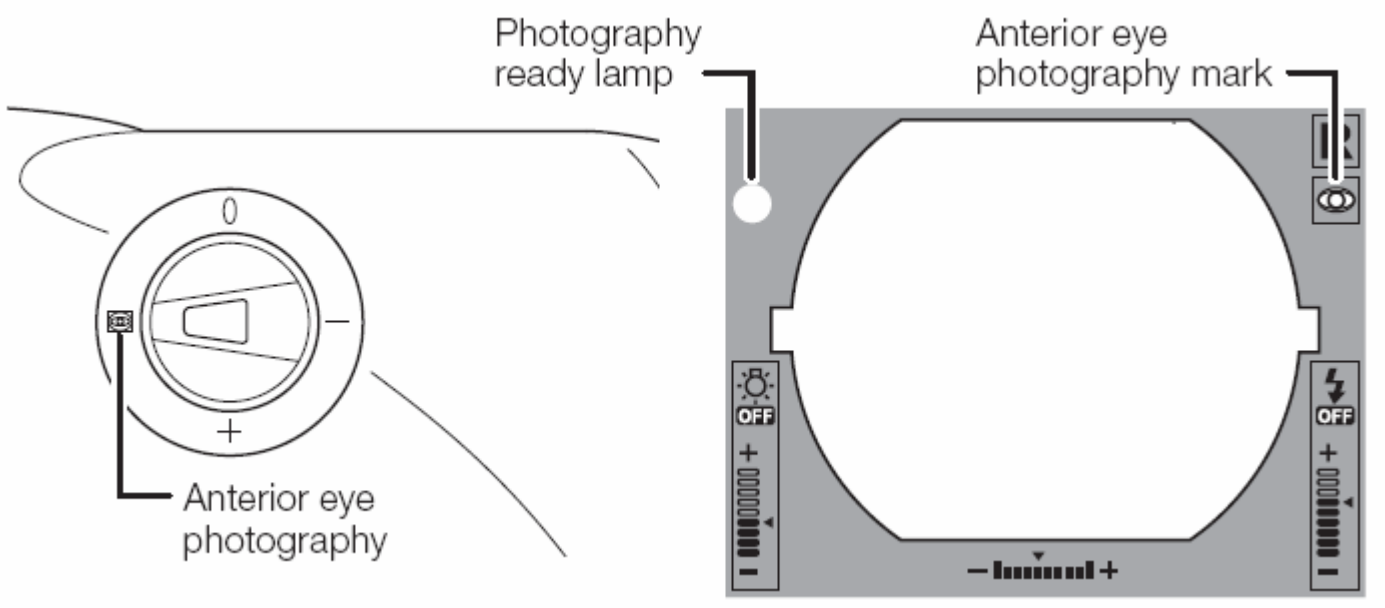
Operation – Anterior Segment



Note: Press X2 to photograph inside eyelash.

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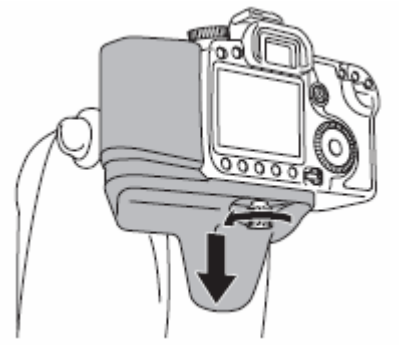
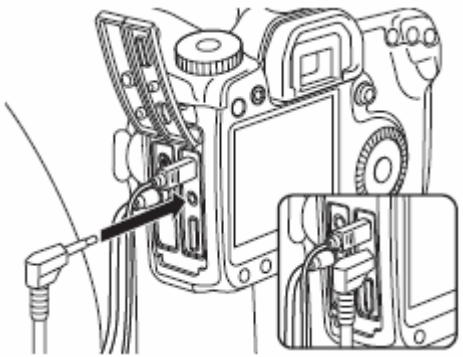
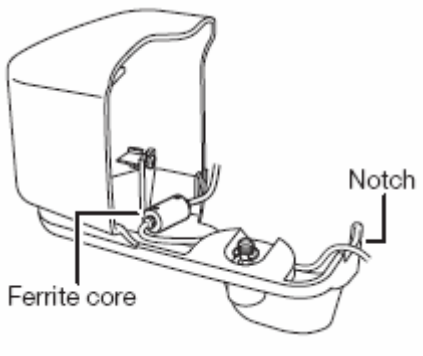
Operation – Install External Monitor

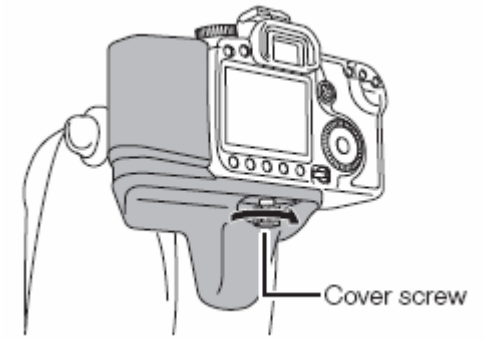


1) Remove camera cover.

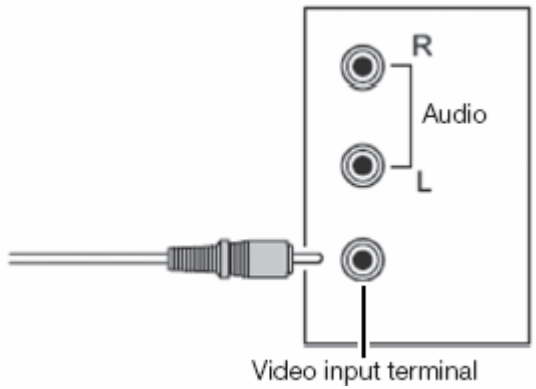




2) Connect video cable to camera.



3) Attach camera cover.



4) Connect video cable to external monitor.

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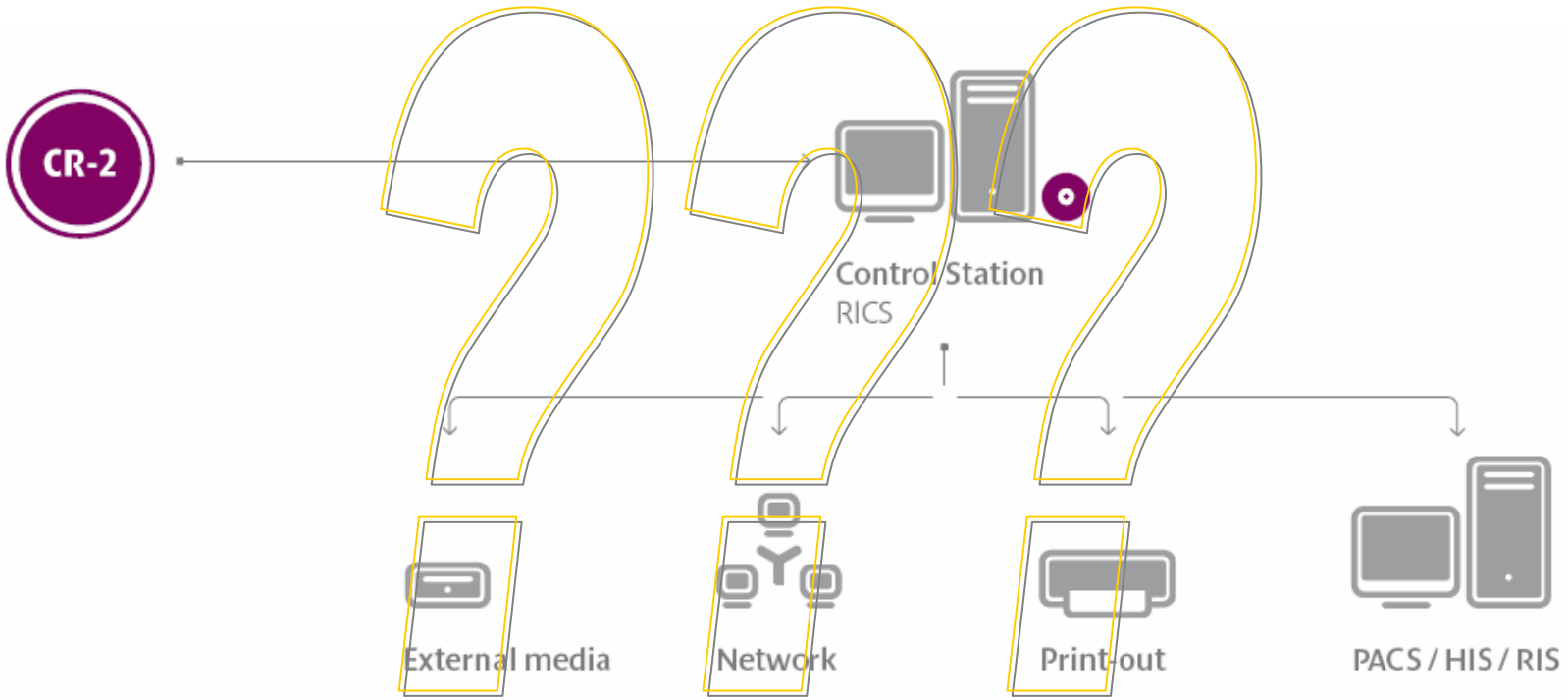
Configuration - What Options?



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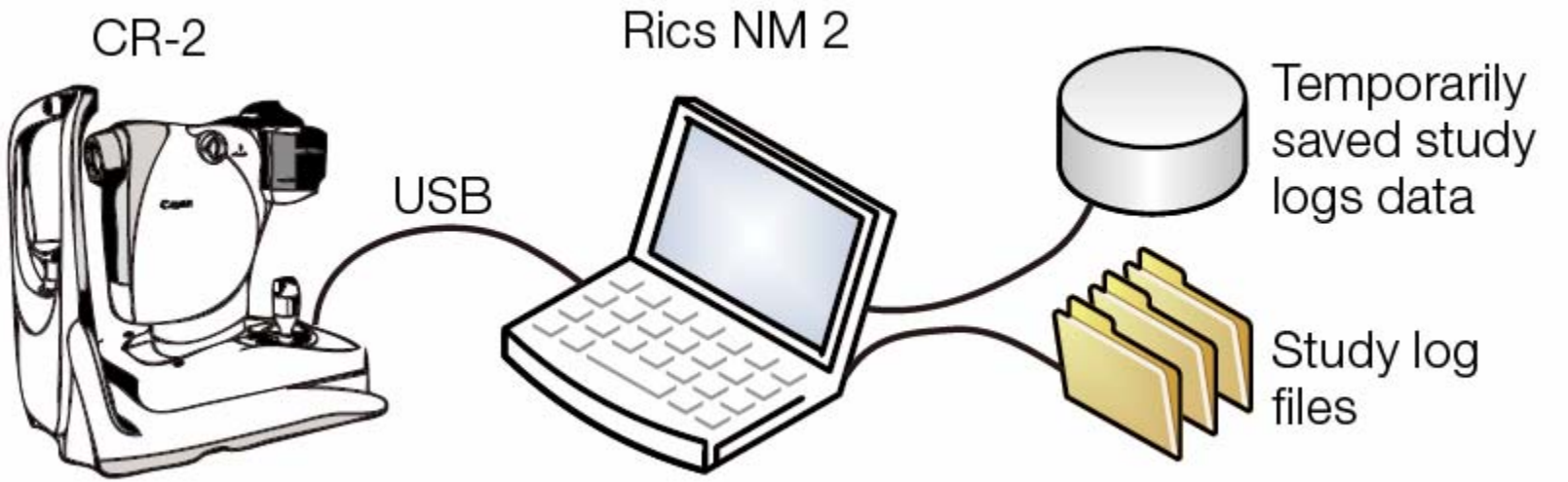
Configuration – Stand-alone

Application – small clinics with private practitioners.



Option	CR-2	Control PC	PPFocus	Printer
A	*	*	*	*
B	*	*		*
C	*	*	*	

NOTE: Printer and control PC by dealers.

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Configuration – Stand-alone

Image output to print and removable media.

	Image Output			
	Prints	DCM	DCM w/ Simple Viewer	JPG
RICSNM2	*	*		*
PPFocus	*	*	*	*

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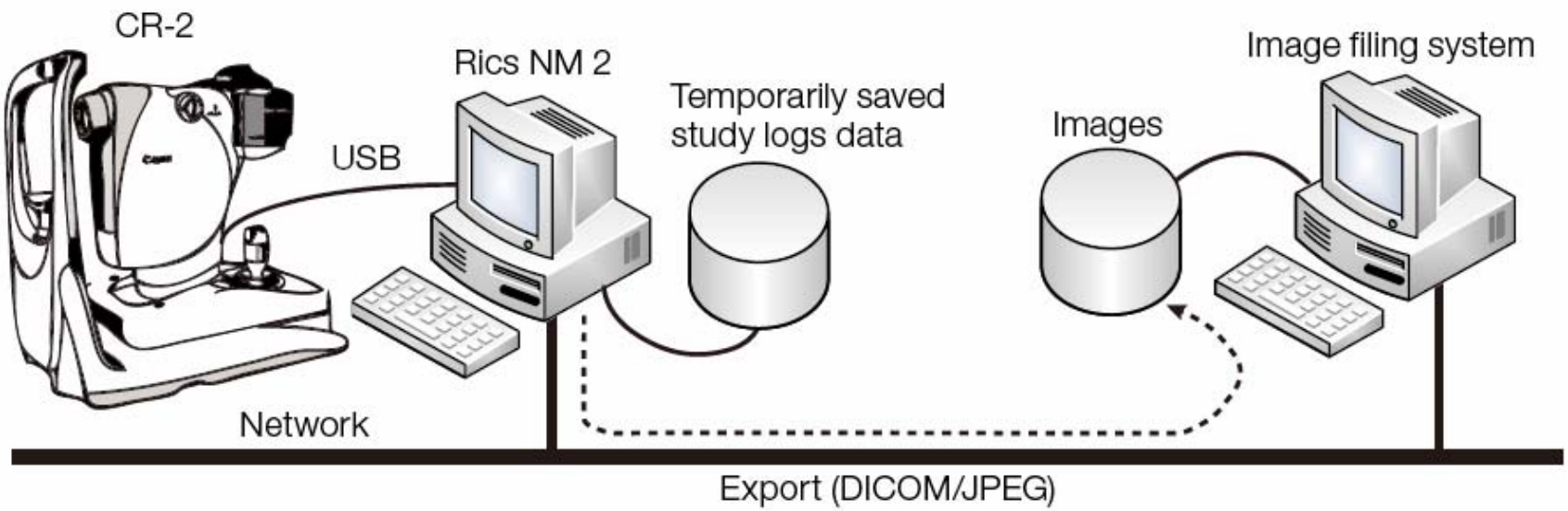
Configuration – Network

Application – mid-sized clinics.



Location	CR-1	Control PC	PPFocus	Printer
Examination Room	*	*		
Consultation Rooms		*	*	*

NOTE: Printer and control PC supply by dealers.

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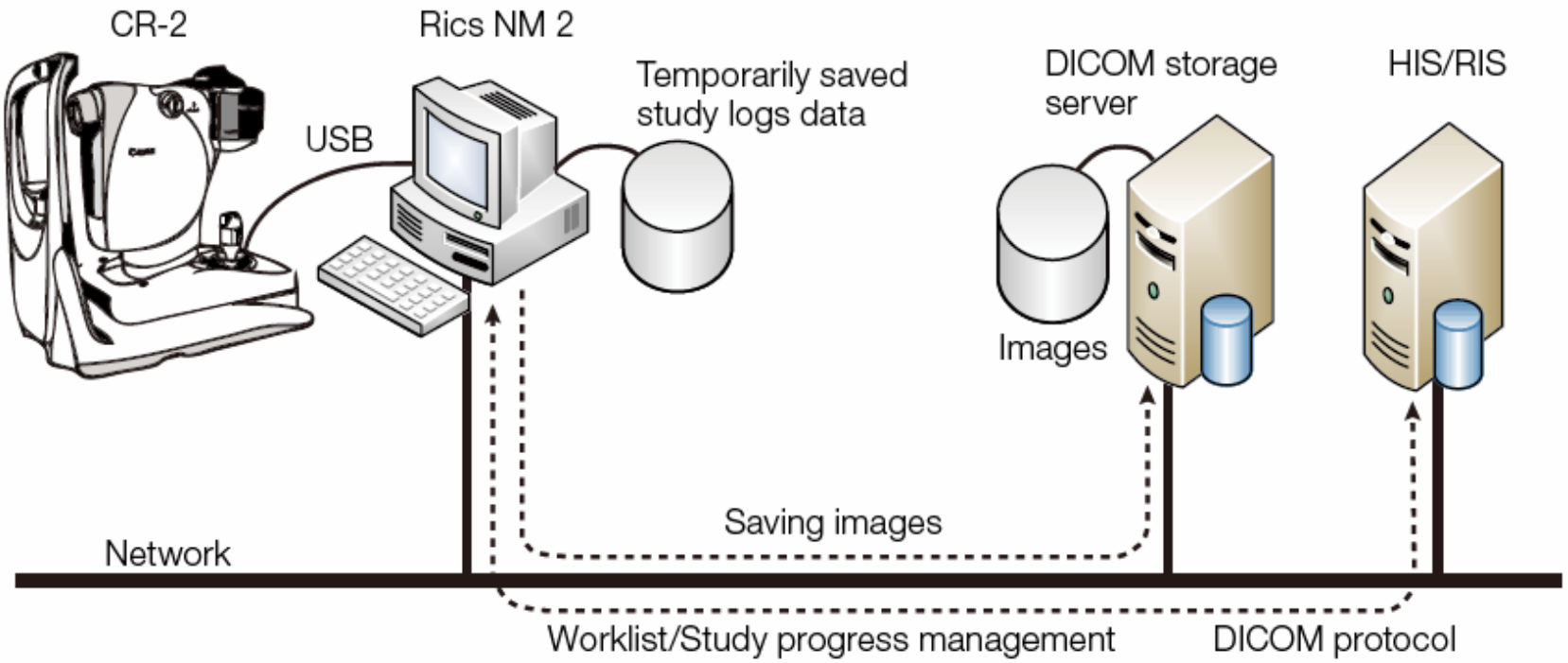
Configuration – Network

Application – hospitals.



NOTE: Printer and control PC supply by dealers. PACS and RIS/HIS are hospital furnished equipments.

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Installation – Control PC Requirements

The RICS NM2 runs under the following operating environment.

Hardware or software	Specifications
CPU	Core 2 Duo 2.4 GHz or higher
RAM	2 GB or more
Display	Screen resolution: WXGA (1280 x 800 pixels) or higher Screen colors: 24 bits or more
Hard disk	3.5-inch 7,200 rpm or higher
Mouse	Microsoft Mouse or compatible mouse
Interface	USB 2.0 (for communication between retinal camera and digital camera) RS-232C (for magnetic card/barcode reader)
OS	Microsoft Windows 7 Professional Microsoft Windows Vista Business SP1/SP2 Microsoft Windows XP Professional SP2/SP3 The Rics NM 2 does not support x64 (64-bit version).
Software	Microsoft .NET Framework Version 3.5 SP1 SQL Server 2005 Express Edition SP3 Canon Easy-PhotoPrint EX Version 2.0.0 or later (for printing captured images)

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Installation – Camera Setting

- Do not change the digital camera settings. If the proper settings are not made, the camera will be unable to take images.
- No CF card is used. Do not insert a CF card into the digital camera.
- After turning on the digital camera or using menu buttons, "No card" and "Sensor cleaning" appear once on the digital camera's LCD display. This is not an error.

Basic settings for the digital camera are shown below.

Items	Settings
Shooting mode	M (Manual exposure)
Expo. comp./AEB	0/Canceled
WB SHIFT/BKT	0,0/±0
Auto power off	Off
Live View function settings Expo. simulation	Disable
Live View function settings Silent shoot	Mode 1

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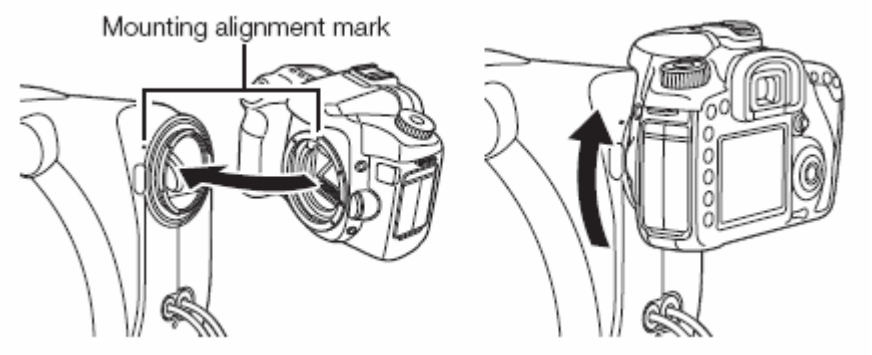
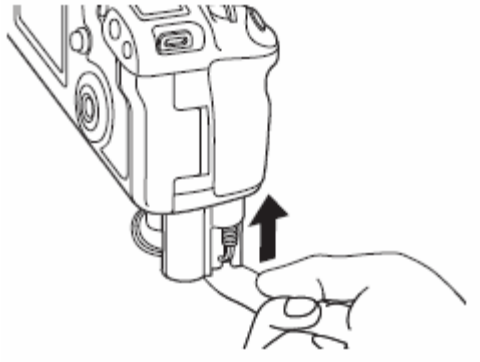
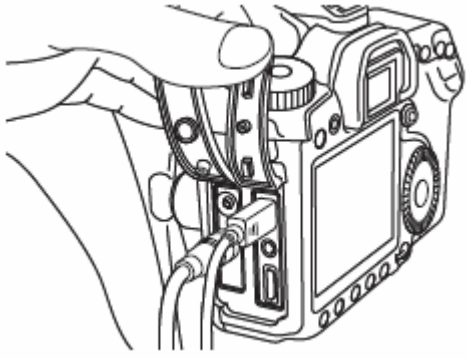
Installation – Procedure

1) Turn off CR-2 and camera. Attach camera to CR-2

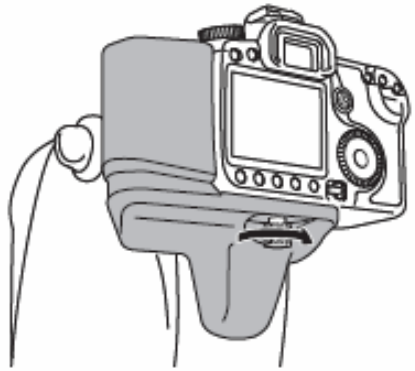




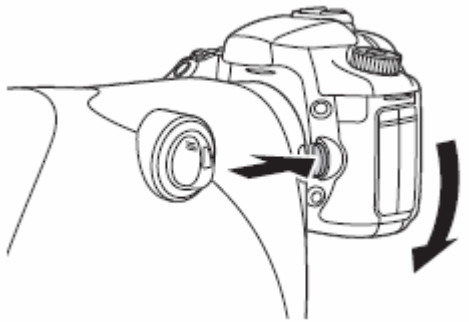
2) Attach DC coupler.



3) Attach cables to CR-2.



4) Attach camera cover.



5) Depress to remove camera.

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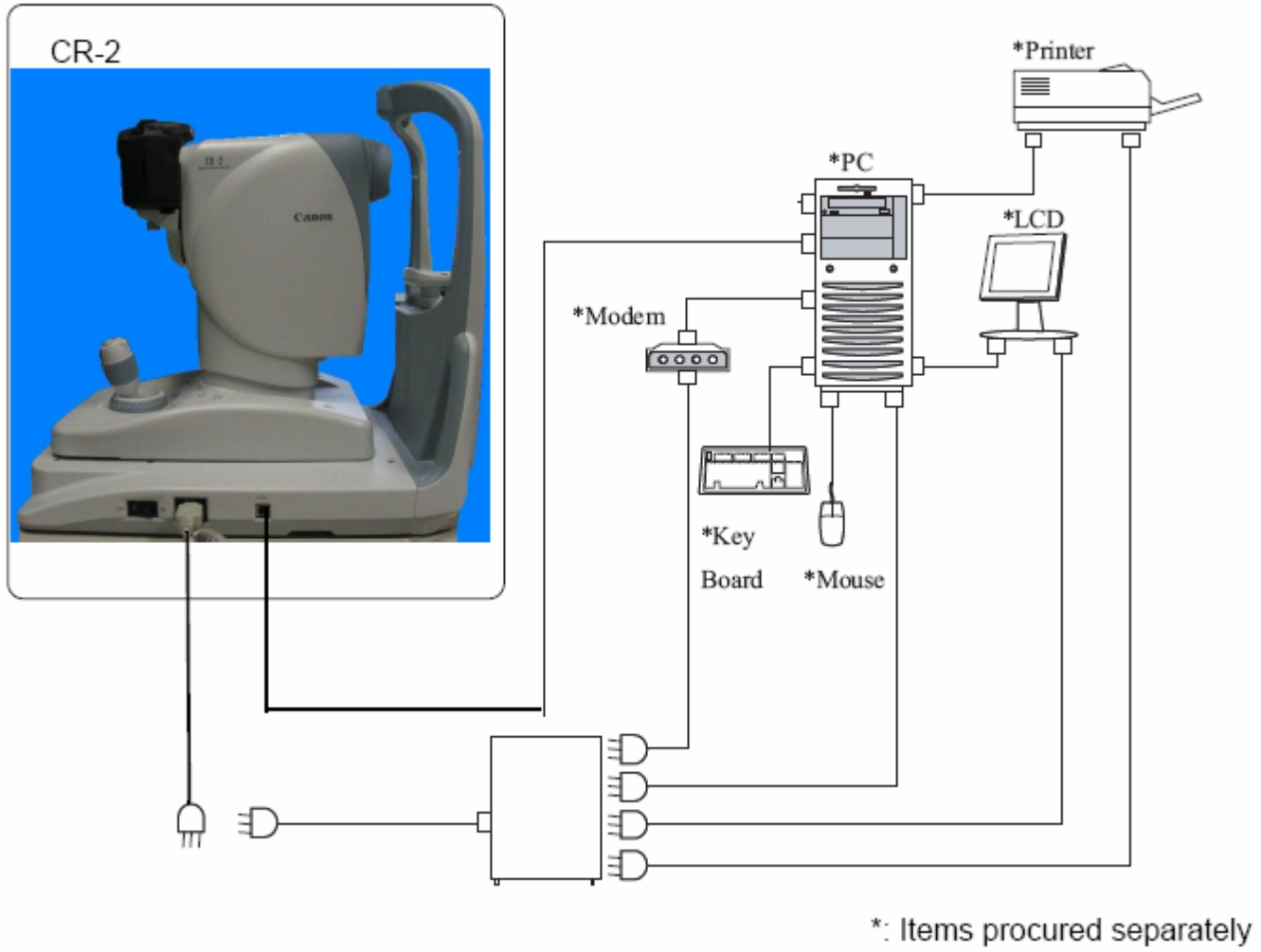
Installation – Procedure



6) Layout cables as shown in the above diagram. Do not connect USB at Control PC's end yet.

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Installation – Procedure

7) Connect the power cord and the USB cable.

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Installation – RICSNM2 Control Software

The control software is installed by following the steps below. Refer to manual.

Steps [1] to [3] essential and mandatory.
Step [4] is optional.

NOTE: All installation (and un-installation) must be performed with administrator authority.

1) Installing the Canon Retinal imaging control software NM2
-Install the control software as well as the run-time library required for the control software.

2) Installing Microsoft SQL Server 2005 Express Edition with SP3
-Install the database engine to be used by the control software.

3) Installing the Canon Retinal camera VCP driver
-Install the USB driver and COM driver required for communication with the CR-1.
(The USB Cable to the CF-1 **MUST BE** connected at this point to detect the presence of hardware).

4) Installing the DICOM layout files for Canon Easy-Photo Print
-Install the DICOM layout files required for printing using the BJ printer and Easy-Photo Print (EPP EX).

5) Disable Auto Play for the Medical EOS when connected.

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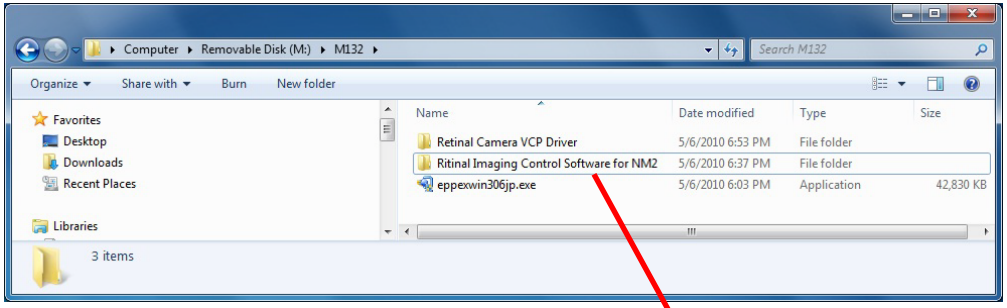
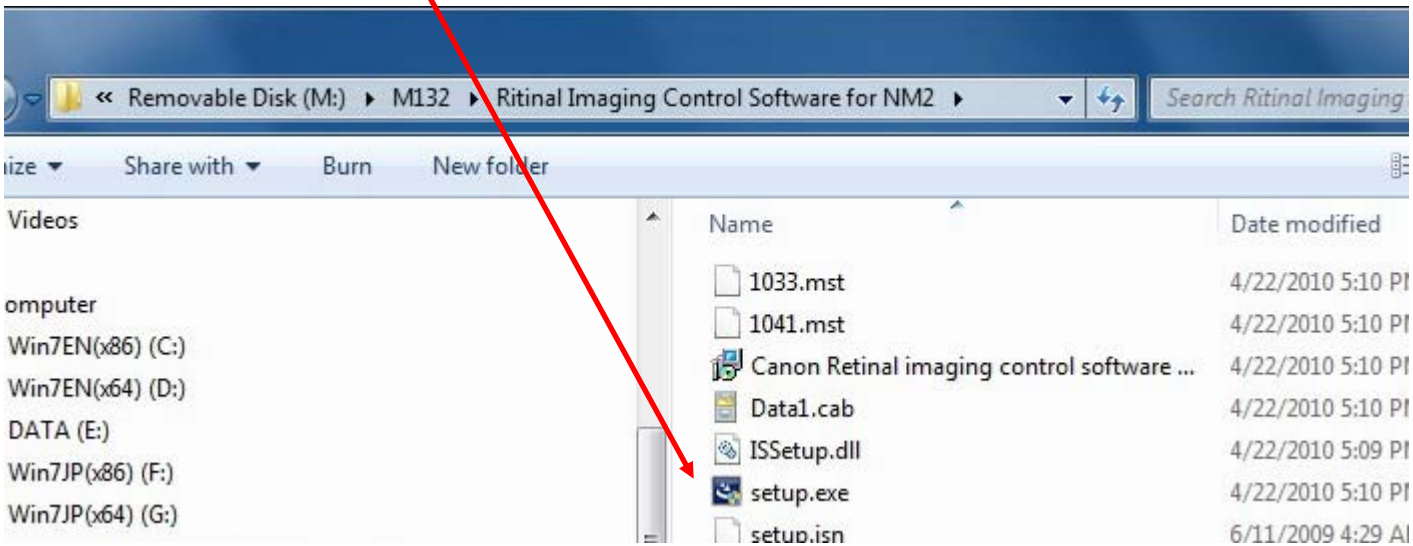
Installation – RICSNM2 Control Software

1) Insert Installer CD into the Control PC to begin installation.





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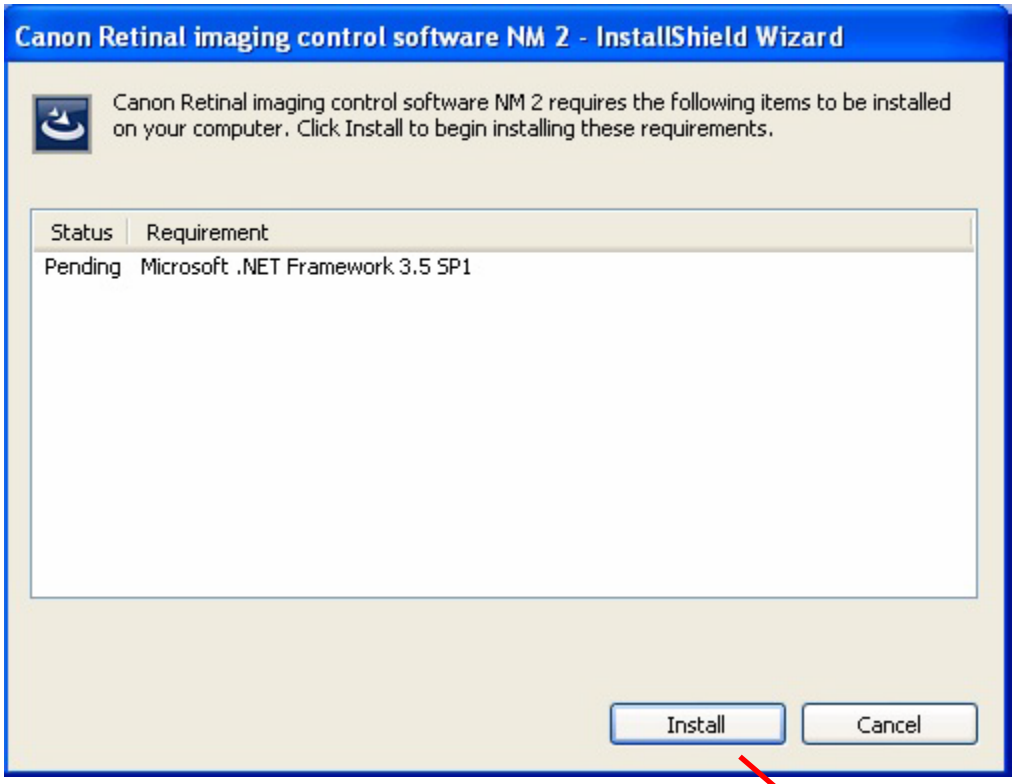
Installation – RICSNM2 Control Software


Canon Retinal imaging control software NM 2 - InstallShield Wizard
Canon Retinal imaging control software NM 2 requires the following items to be installed on your computer. Click Install to begin installing these requirements.
Status
Requirement
Pending
Microsoft .NET Framework 3.5 SP1
Install
Cancel

2) Left window will only pop up if .NET is not pre-installed on the Control PC. Install in this case otherwise proceed to next step 3.

Canon Retinal imaging control software NM 2 - InstallShield Wizard
The installation of Canon Retinal imaging control software NM 2 requires a reboot. Click Yes to restart now or No if you plan to restart later.
Yes
No

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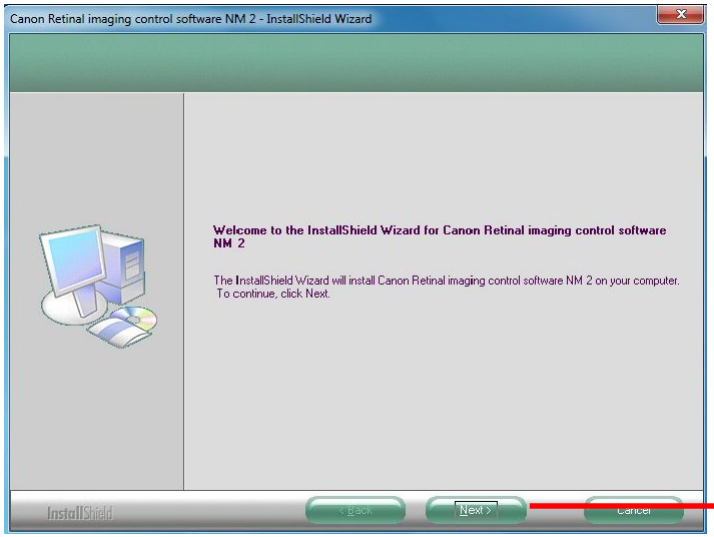
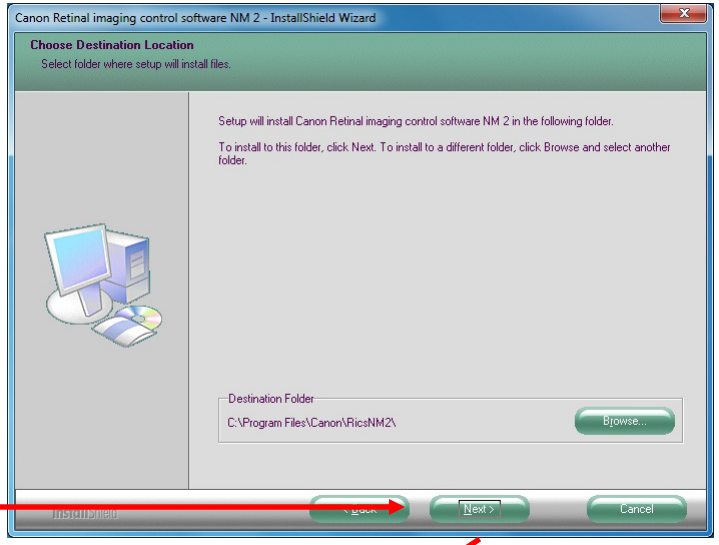
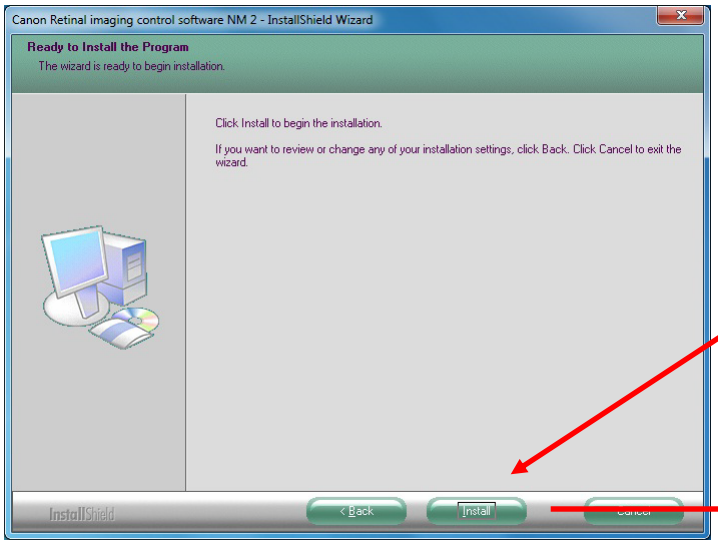
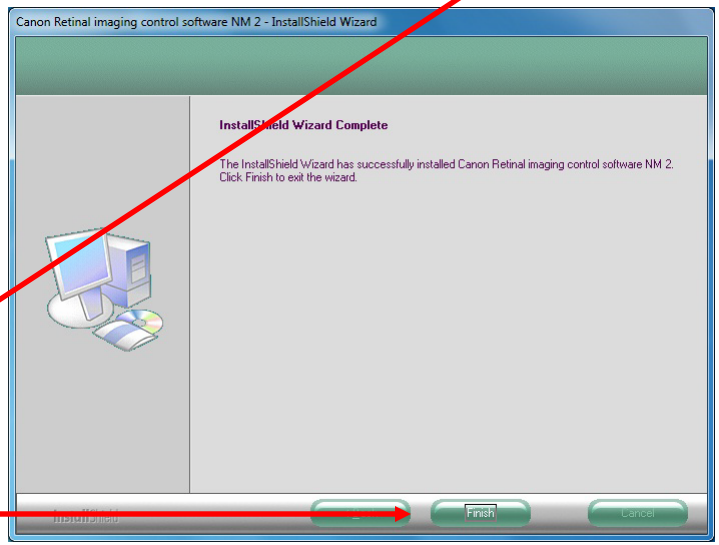
Installation – RICSNM2 Control Software

3)


Canon Retinal imaging control software NM 2 - InstallShield Wizard
Welcome to the InstallShield Wizard for Canon Retinal imaging control software NM 2
The InstallShield Wizard will install Canon Retinal imaging control software NM 2 on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel


Canon Retinal imaging control software NM 2 - InstallShield Wizard
Choose Destination Location
Select folder where setup will install files.
Setup will install Canon Retinal imaging control software NM 2 in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\Canon\RicsNM2\
Browse...
InstallShield
< Back
Next >
Cancel


Canon Retinal imaging control software NM 2 - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel


Canon Retinal imaging control software NM 2 - InstallShield Wizard
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Canon Retinal imaging control software NM 2. Click Finish to exit the wizard.
InstallShield
< Back
Finish
Cancel

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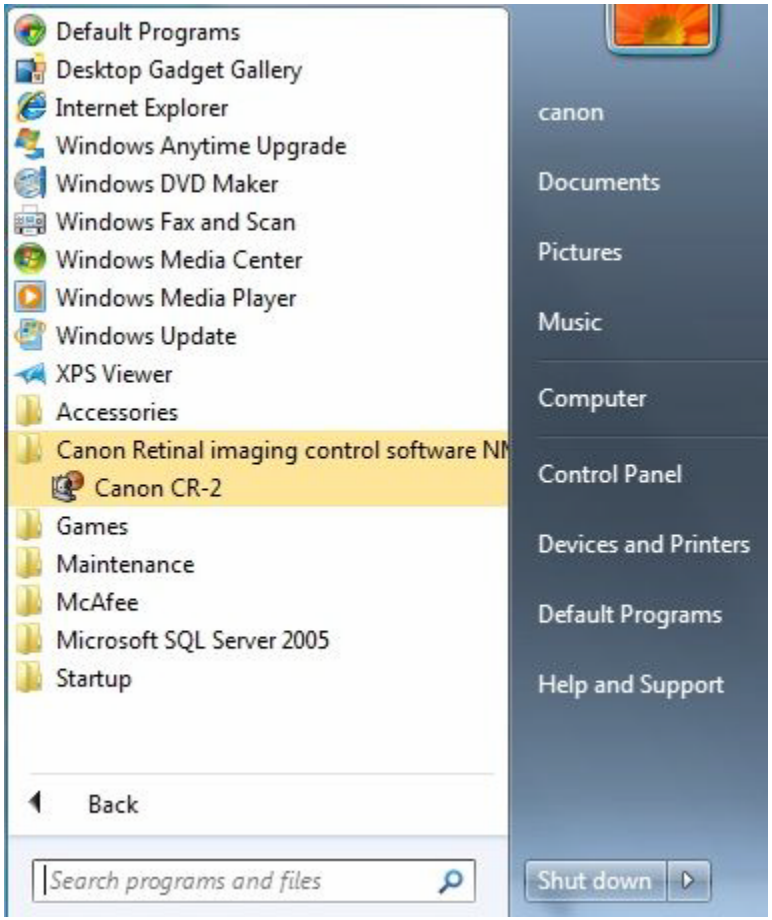
Installation – RICSNM2 Control Software



4) Shortcut will be created.

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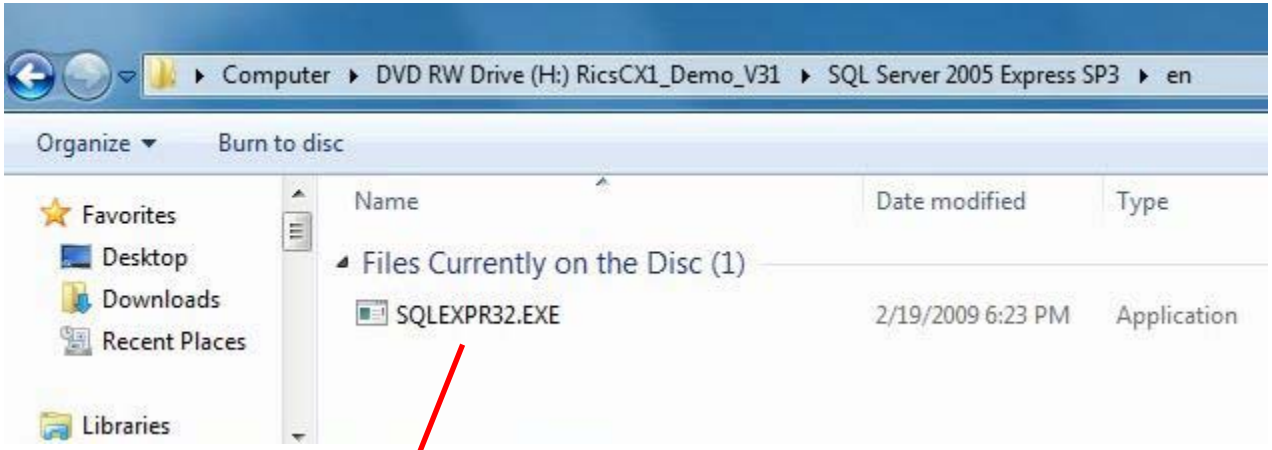
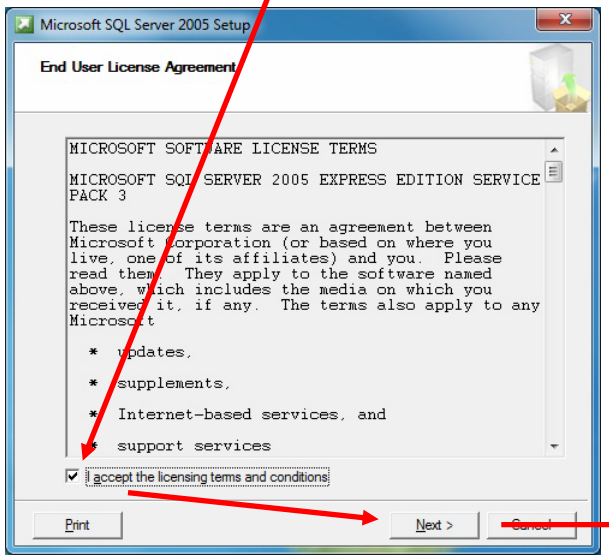
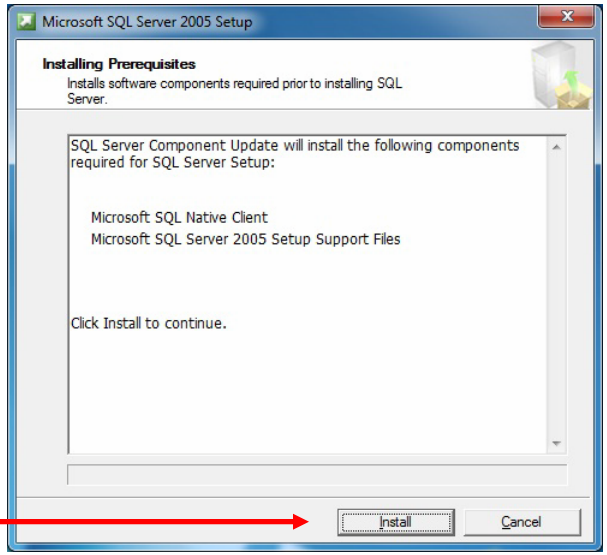
Installation – RICSNM2 Control Software

5) Install MS SQL 2005 SP3 from the Installer CD.




Microsoft SQL Server 2005 Setup
End User License Agreement
MICROSOFT SOFTWARE LICENSE TERMS
MICROSOFT SQL SERVER 2005 EXPRESS EDITION SERVICE PACK 3
These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft
* updates,
* supplements,
* Internet-based services, and
* support services
I accept the licensing terms and conditions
Print
Next >
Cancel


Microsoft SQL Server 2005 Setup
Installing Prerequisites
Installs software components required prior to installing SQL Server.
SQL Server Component Update will install the following components required for SQL Server Setup:
Microsoft SQL Native Client
Microsoft SQL Server 2005 Setup Support Files
Click Install to continue.
Install
Cancel

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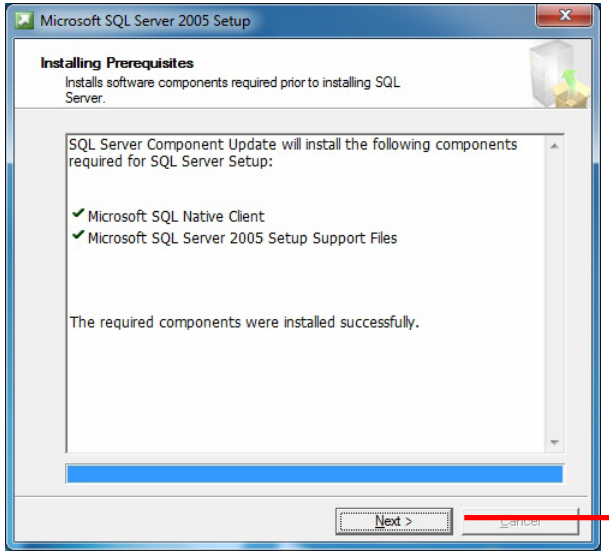
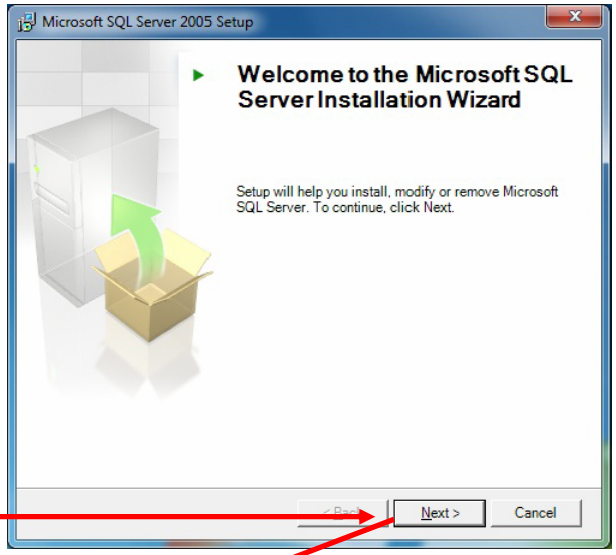
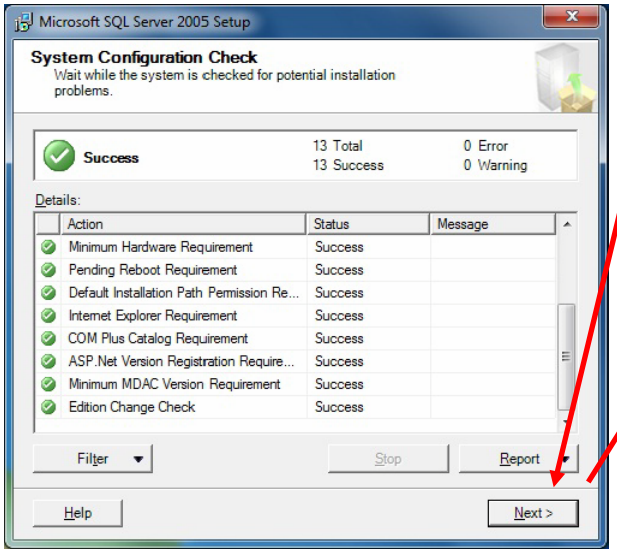
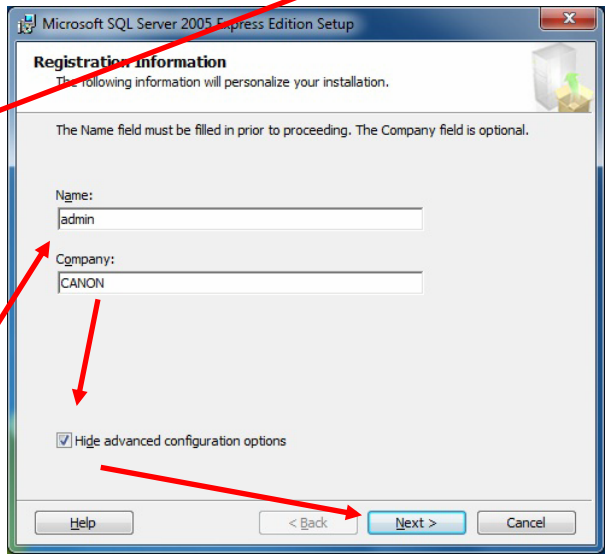
Installation – RICSNM2 Control Software


Microsoft SQL Server 2005 Setup
Installing Prerequisites
Installs software components required prior to installing SQL Server.
SQL Server Component Update will install the following components required for SQL Server Setup:
Microsoft SQL Native Client
Microsoft SQL Server 2005 Setup Support Files
The required components were installed successfully.
Next >
Cancel


Microsoft SQL Server 2005 Setup
Welcome to the Microsoft SQL Server Installation Wizard
Setup will help you install, modify or remove Microsoft SQL Server. To continue, click Next.
< Back
Next >
Cancel





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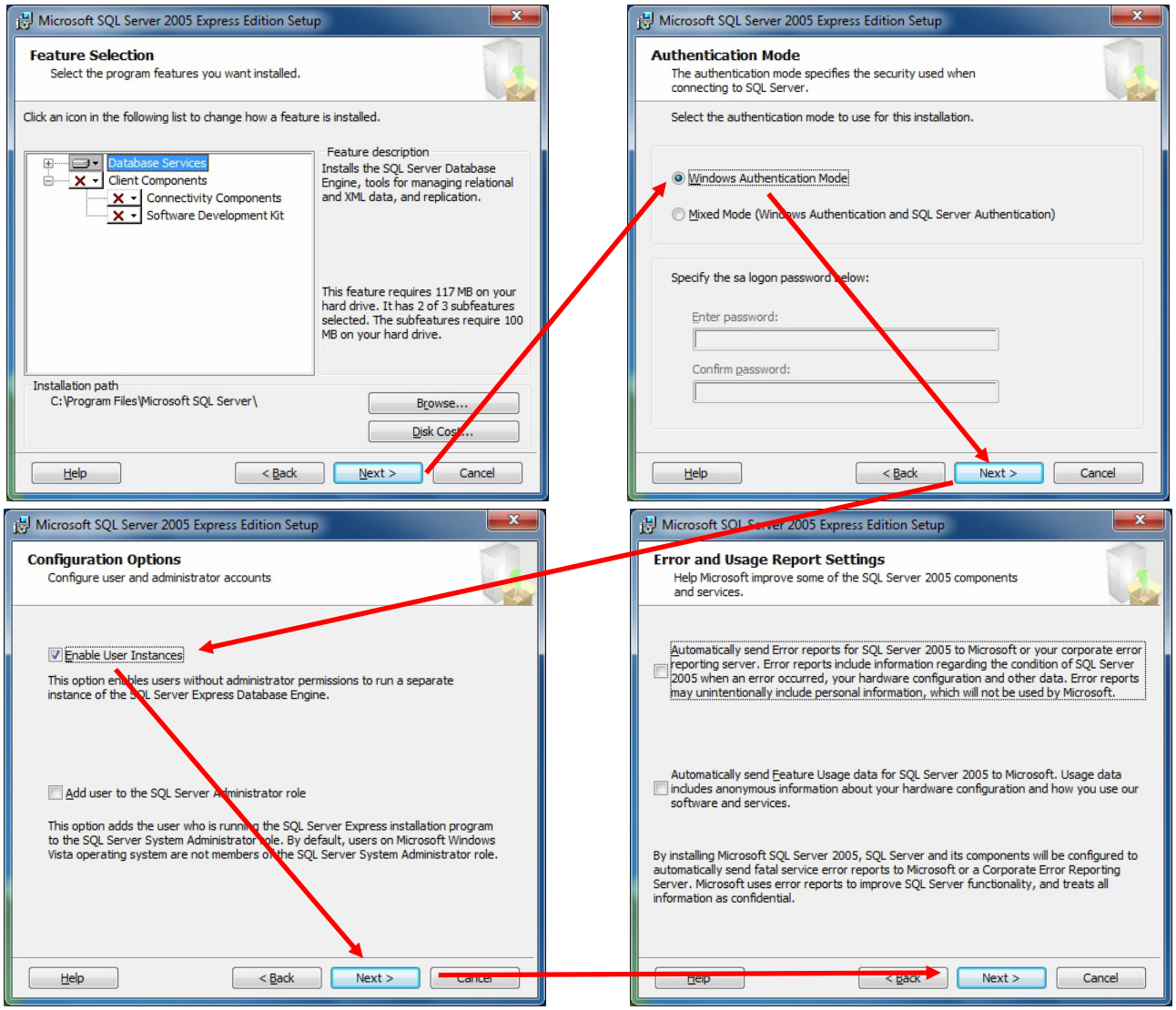
Installation – RICSNM2 Control Software


Microsoft SQL Server 2005 Express Edition Setup
Feature Selection
Select the program features you want installed.
Click an icon in the following list to change how a feature is installed.
Database Services
Client Components
Connectivity Components
Software Development Kit
Feature description
Installs the SQL Server Database Engine, tools for managing relational and XML data, and replication.
This feature requires 117 MB on your hard drive. It has 2 of 3 subfeatures selected. The subfeatures require 100 MB on your hard drive.
Installation path
C:\Program Files\Microsoft SQL Server\
Browse...
Disk Cost...
Help
< Back
Next >
Cancel
Microsoft SQL Server 2005 Express Edition Setup
Authentication Mode
The authentication mode specifies the security used when connecting to SQL Server.
Select the authentication mode to use for this installation.
Windows Authentication Mode
Mixed Mode (Windows Authentication and SQL Server Authentication)
Specify the sa logon password below:
Enter password:
Confirm password:
Help
< Back
Next >
Cancel
Microsoft SQL Server 2005 Express Edition Setup
Configuration Options
Configure user and administrator accounts
Enable User Instances
This option enables users without administrator permissions to run a separate instance of the SQL Server Express Database Engine.
Add user to the SQL Server Administrator role
This option adds the user who is running the SQL Server Express installation program to the SQL Server System Administrator role. By default, users on Microsoft Windows Vista operating system are not members of the SQL Server System Administrator role.
Help
< Back
Next >
Cancel
Microsoft SQL Server 2005 Express Edition Setup
Error and Usage Report Settings
Help Microsoft improve some of the SQL Server 2005 components and services.
Automatically send Error reports for SQL Server 2005 to Microsoft or your corporate error reporting server. Error reports include information regarding the condition of SQL Server 2005 when an error occurred, your hardware configuration and other data. Error reports may unintentionally include personal information, which will not be used by Microsoft.
Automatically send Feature Usage data for SQL Server 2005 to Microsoft. Usage data includes anonymous information about your hardware configuration and how you use our software and services.
By installing Microsoft SQL Server 2005, SQL Server and its components will be configured to automatically send fatal service error reports to Microsoft or a Corporate Error Reporting Server. Microsoft uses error reports to improve SQL Server functionality, and treats all information as confidential.
Help
< Back
Next >
Cancel

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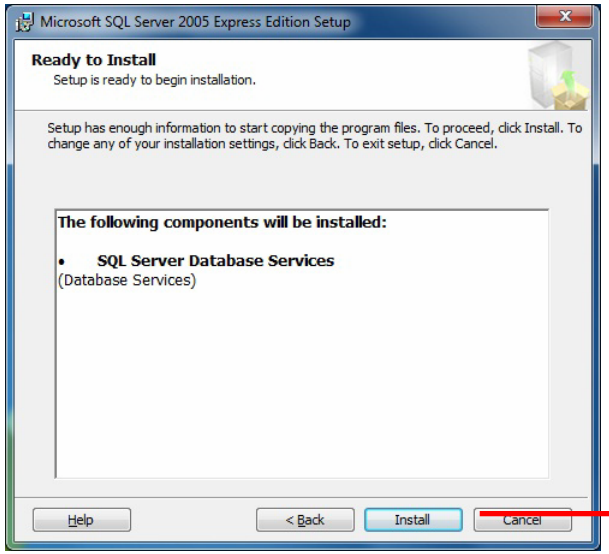
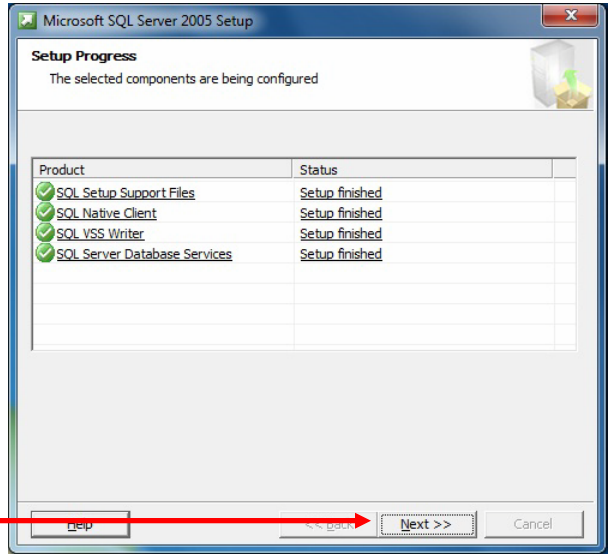
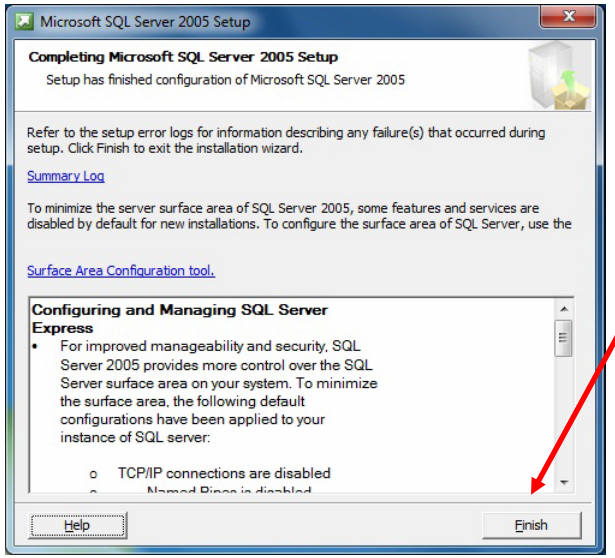
Installation – RICSNM2 Control Software


Microsoft SQL Server 2005 Express Edition Setup
Ready to Install
Setup is ready to begin installation.
Setup has enough information to start copying the program files. To proceed, click Install. To change any of your installation settings, click Back. To exit setup, click Cancel.
The following components will be installed:
SQL Server Database Services
(Database Services)
Help
< Back
Install
Cancel




Microsoft SQL Server 2005 Setup
Completing Microsoft SQL Server 2005 Setup
Setup has finished configuration of Microsoft SQL Server 2005
Refer to the setup error logs for information describing any failure(s) that occurred during setup. Click Finish to exit the installation wizard.
Summary Log
To minimize the server surface area of SQL Server 2005, some features and services are disabled by default for new installations. To configure the surface area of SQL Server, use the
Surface Area Configuration tool.
Configuring and Managing SQL Server Express
For improved manageability and security, SQL Server 2005 provides more control over the SQL Server surface area on your system. To minimize the surface area, the following default configurations have been applied to your instance of SQL server:
TCP/IP connections are disabled
Help
Finish

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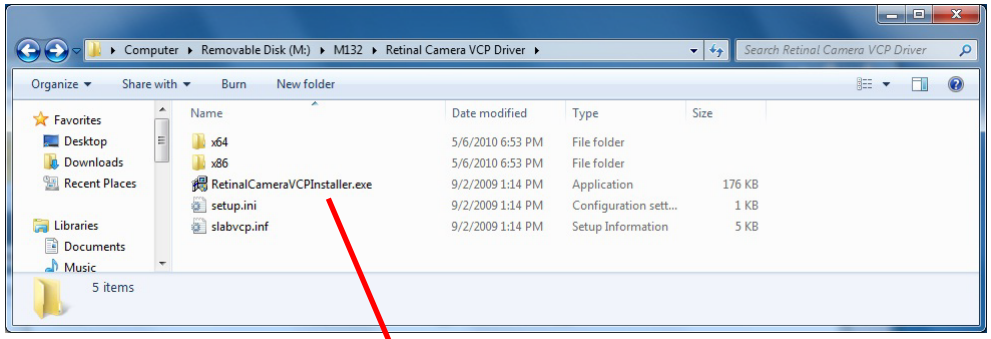
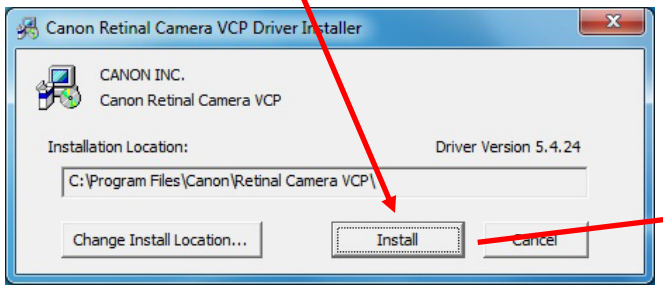
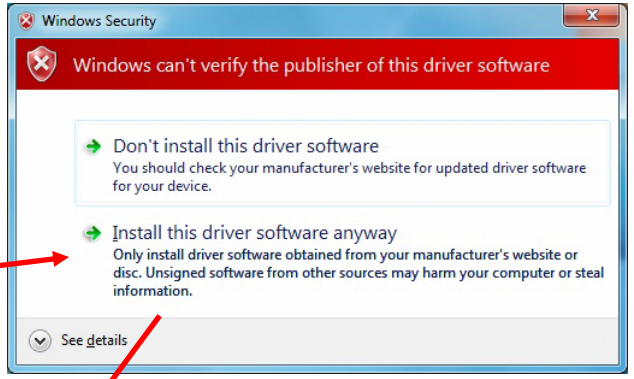
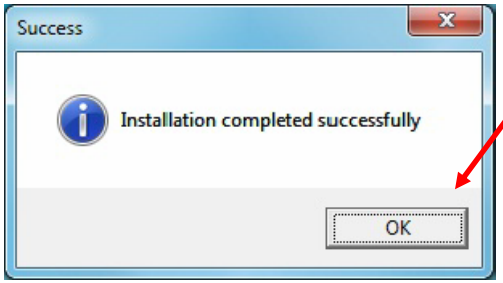
Installation – RICSNM2 Control Software

6) Install VCP (Virtual Com Port) from the Installer CD.






Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details



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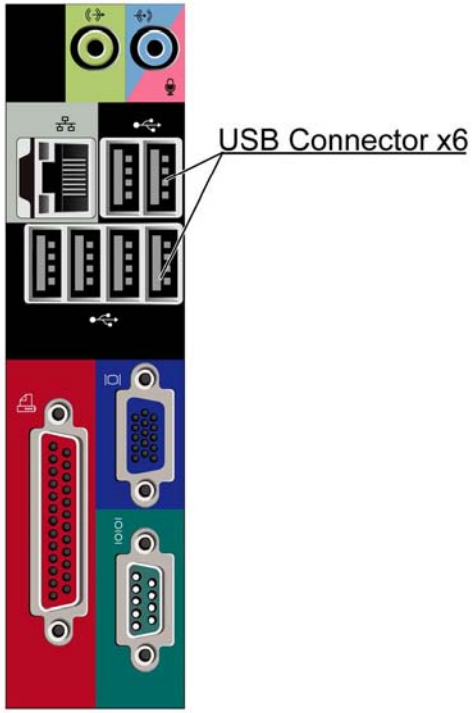
Installation – RICSNM2 Control Software

7) Connect the USB cable to the Control PC now.



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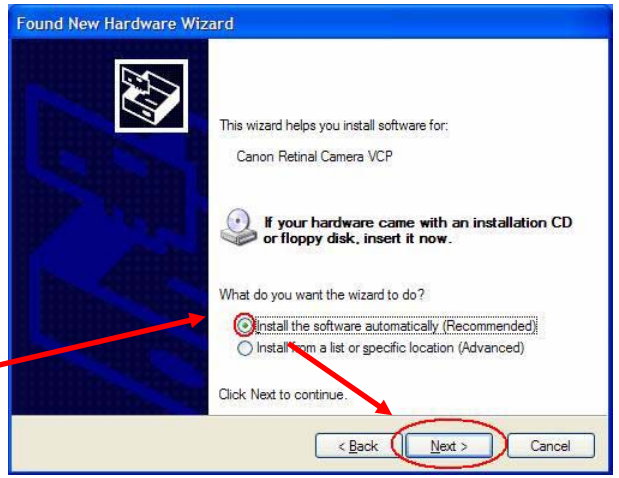
Installation – RICSNM2 Control Software

8) Register CR-2 as new hardware device.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
This wizard helps you install software for:
Canon Retinal Camera VCP
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Hardware Installation
The software you are installing for this hardware:
Canon Retinal Camera VCP
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

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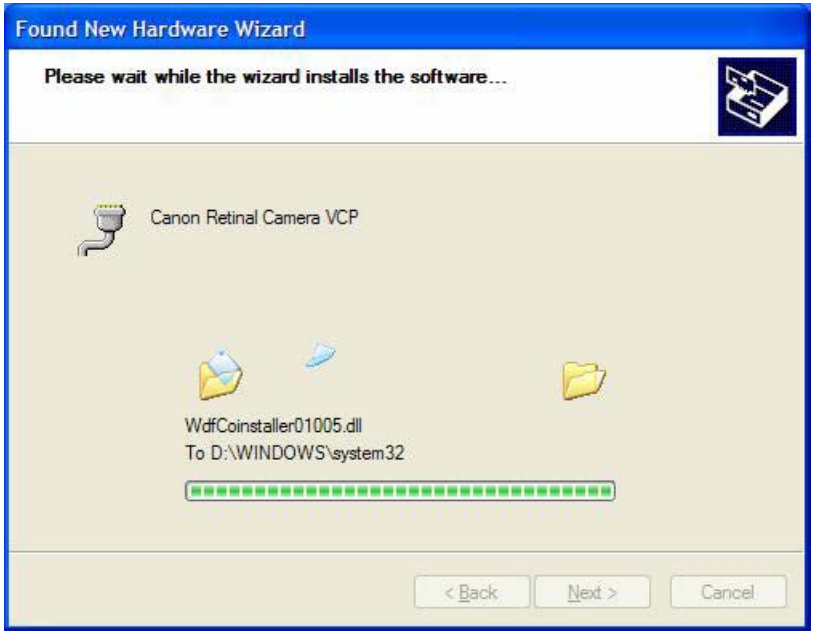
Installation – RICSNM2 Control Software



Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Canon Retinal Camera VCP
Click Finish to close the wizard.
< Back
Finish
Cancel

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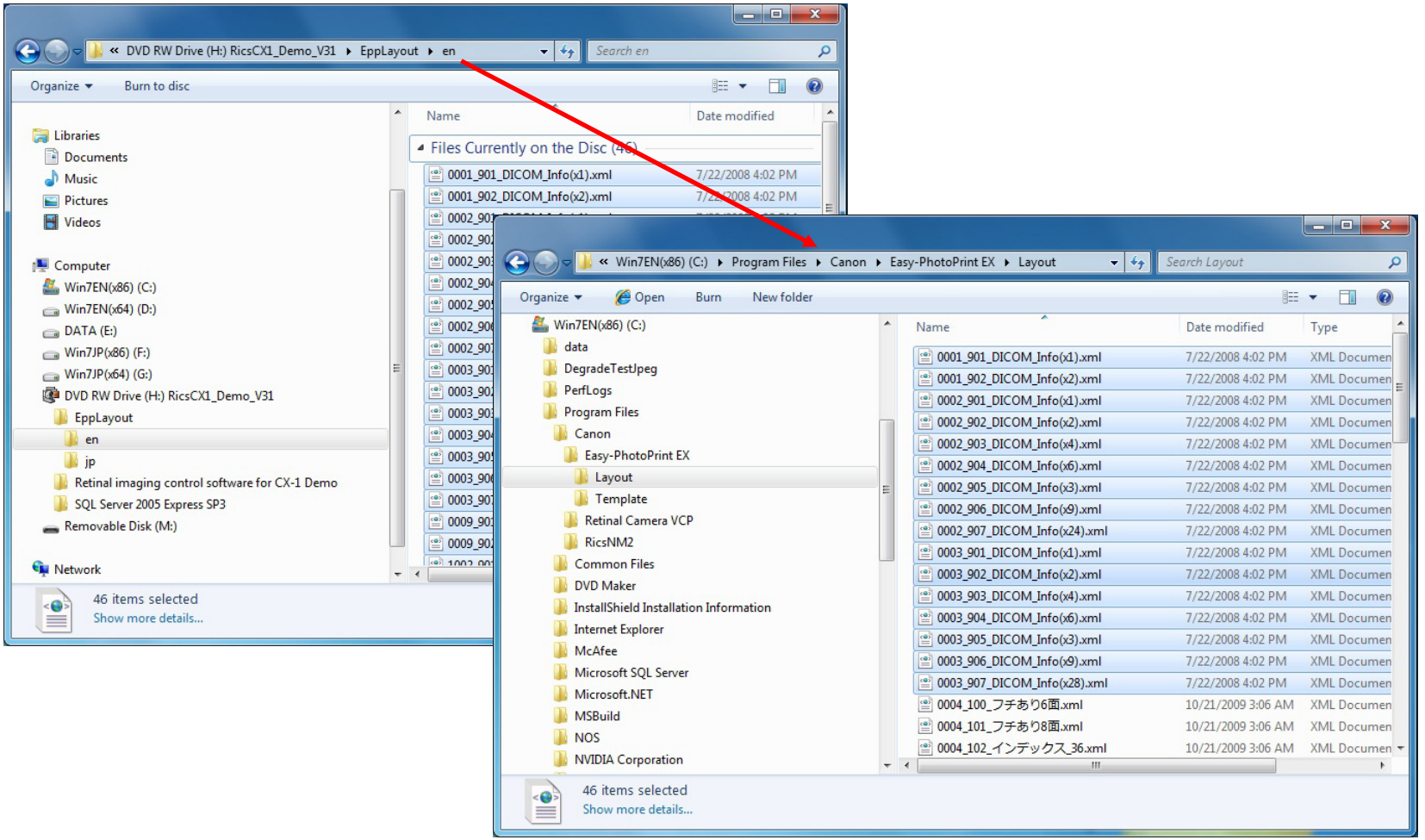
Installation – RICSNM2 Control Software

9) Copy the DICOM layout files from Installer CD to EPP EX Layout folder. Easy PhotoPrint EX application accompanying the Canon printer must be installed first.



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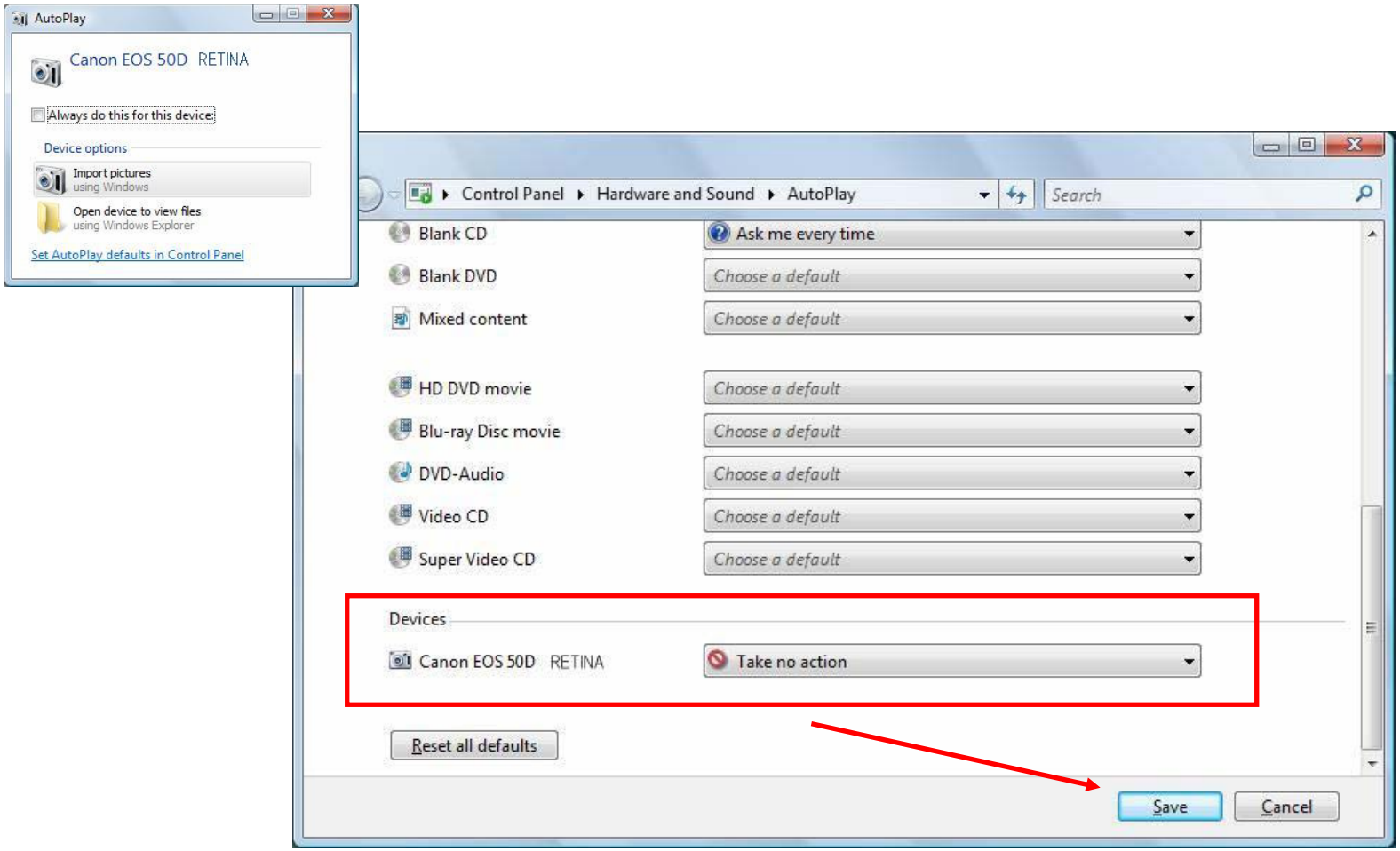
Installation – RICSNM2 Control Software

10) Disable Auto Play for the Camera.



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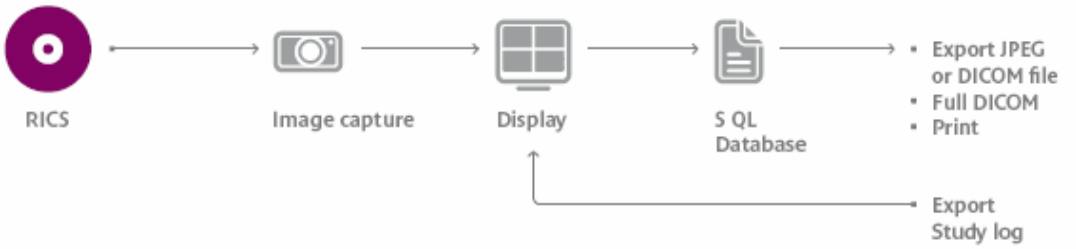
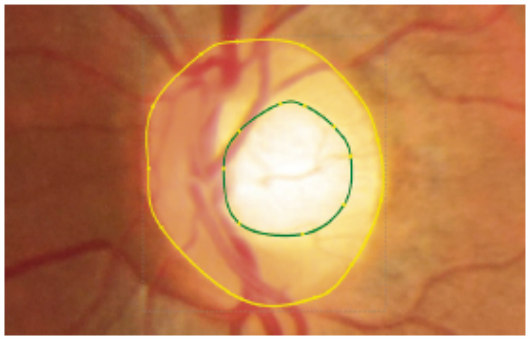
Introduction – RICSNM2 Control Software

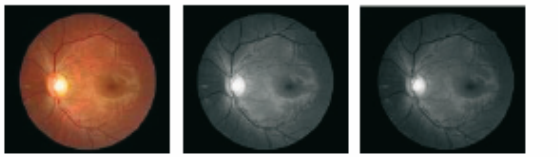
RICS Retinal Imaging Control Software



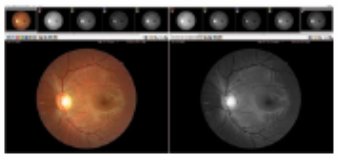
RICS main screen [1]



C/D ratio measurement [2]



Photography modes [3]



Comparison studies [4]

The latest version of Canon's extensive Retinal Image Control Software (RICS) supports Windows 7 and the export of data. Collecting, processing, archiving and referencing has been made much easier. RGB images or line drawings of current C/D ratio measurements can be stored easily as well as patient name, patient ID, accession number, right/left eye, photographic mode and date of examination.

1) High-quality retinal image capture, including comment input function.

2) C/D ratio measurements by area or line.

3) Digital filtered images for colour, red-free and cobalt photography and RGB images can now be stored.

4) Diagnostic functions to compare studies from the same patient.

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Introduction – RICSNM2 Control Software

Canon
Delighting You Always

Features

Study input

- Accepting input from keyboard, magnetic card, and barcode readers.
- Accepting input from worklist.
- Assigning accession numbers automatically.

Taking images

- Acquiring the retinal images and right/left eye information taken with the retinal camera.
- Flash intensity and observation light brightness can be automatically adjusted.

Image display

- Full-screen view is possible.
- Stereo photography and stereo view are possible.
- Comparison with past images is possible.
- Screens can be captured.

Image processing

- Red, Green, Blue, digital Redfree, and digital Cobalt in color images can be displayed.
- C/D ratio (area, linear, verticalness) can be measured.
- Image adjustment (contrast, brightness, gamma, hue) is possible.
- Processed images (generated images) can be saved.

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Introduction – RICSNM2 Control Software

Printing

- Simple printing and multiple layout printing.

Database

- Managing and storing the study and patient information by individual studies.
- Study data on the database can be stored on DVD or external hard disk.
- Externally saved study data can be imported.

Transferring and exporting images

- Exporting to JPEG format file containing DICOM or study information.
- Simultaneously transferring studies to two destinations. You can specify DICOM storage servers and folders on the network as the destinations.

DICOM standard compliant

- Study information can be acquired from HIS/RIS using Modality Worklist.
- Sending study status information to HIS/RIS with the MPPS function.
- Sending images to the DICOM storage server with DICOM Storage Service.

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Introduction – Note on Use

Software

(1) The Rics NM 2 can be used only by users who belong to the following groups:
Windows 7 / Windows Vista: Users or Administrators
Windows XP: Administrators

(2) The Rics NM 2 enables the retinal camera taking 30 images in a single study.

(3) In a Windows operating environment, be sure to set the access permissions for the storage folder in the following cases.

- When exporting files to a destination set with the **Storage Type** of **Export (DICOM)** or **Export (JPEG)**
- When changing the saving folder for the study management to a folder from the default folder (Installation folder\Database\Images)
- When saving the temporarily saved study logs
- When using a study file for list input (such as ccrhis.his)

In the **Security** tab under the folder **Properties**, give **Modify** permission to the Users group and **Full control** permission to the Administrators group.

(4) Use care with the following when saving the temporarily saved study logs or viewing the study log files.

- To specify a folder on the network, get the access rights to the folder as the Windows login user. For details on the access rights on the network, contact the system administrator.
- Do not set the password on the removable media (CD, DVD or flash drive etc.).

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Introduction – Note on Use

(5) Do not use the **Switch User** (where the user is switched without logging off) in Windows. When multiple users are using the Rics NM 2, be sure to select **Log Off**, and then log on again as a different user.

(6) Be sure to set the Screen saver, Power Options and Font settings as shown below.

Windows 7

Items	Settings
Screen saver	None
Turn off the display	Never
Put the computer to sleep	Never
Turn off hard disks	Never
When I press the power button	Shut down
Start menu power button	Shut down
Font size	Smaller - 100% (default)

Windows Vista

Items	Settings
Screen saver	None
Turn off the display	Never
Put the computer to sleep	Never
Turn off hard disks	Never
When I press the power button	Shut down
Start menu power button	Shut down
Font size	Default scale (96 DPI)

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Introduction – Note on Use

Windows XP

Items	Settings
Screen saver	None
Turn off monitor	Never
Turn off hard disks	Never
System standby	Never
When I press the power button on my computer	Shut down
Enable hibernation	Disable
Font size	Normal

During the Windows shut down process, do not perform any of the following operations.

Windows 7 / Windows Vista: Sleep

Windows XP: Standby

(7) If an application error appears, the Rics NM 2 freezes or the captured image does not appear during a study, take the following steps.

1) Turn off the retinal camera and digital camera.
2) Turn off the PC.
3) Remove the DC coupler from the digital camera, and then re-insert it.
4) Turn on the PC.
5) After the OS starts up, turn on the retinal camera and digital camera.
6) Start up the Rics NM 2.

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Introduction – Note on Use

(8) To prevent a wizard or menu from automatically opening while the digital camera is connected to the Windows PC, take the following steps.

Windows 7 / Windows Vista:

1) Open the **Control Panel**, and click **Hardware and Sound** and click **Play CDs or other media automatically**.
2) Select **Take no action** from the dropdown list for **Canon EOS 50D RETINA**. Then, click **Save**.

Windows XP:

1) Select **Scanners and Cameras** in the **Control Panel**.
2) Right-click **Canon EOS 50D RETINA**, then open the **Properties** screen.
3) Click the **Events** tab and select **Take no action**, then click **OK**.

(9) The Rics NM 2 does not support environment-dependent characters extended in Windows 7/ Windows Vista.

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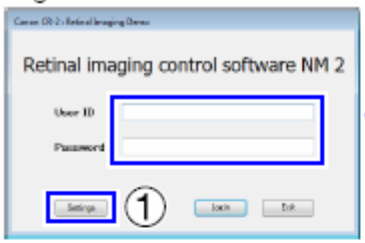
Setup and Configuration – Login

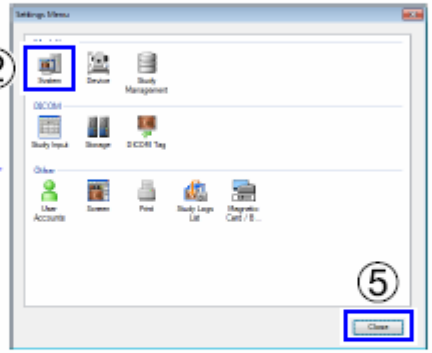
Login screen



User ID – canon
Password – canon

NOTE: LOGIN not possible if essential setup is not completed.

Settings Menu screen



Setting screen

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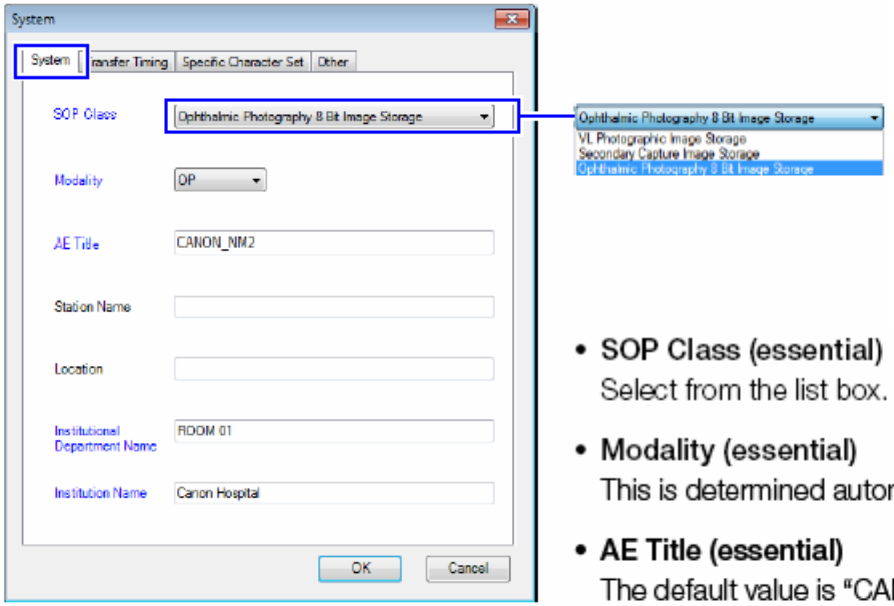
Setup and Configuration – System



- **SOP Class (essential)**
  Select from the list box.
- **Modality (essential)**
  This is determined automatically in accordance with the SOP Class setting. (XC/OT/OP)
- **AE Title (essential)**
  The default value is "CANON_NM2".
- **Station Name**
  Input the station name. Blank spaces only cannot be set.
- **Location**
  Input the location. Blank spaces only cannot be set.
- **Institutional Department Name (essential)**
  Input the institutional department name. Blank spaces only cannot be set.
- **Institution Name (essential)**
  Input the institution name. Blank spaces only cannot be set.

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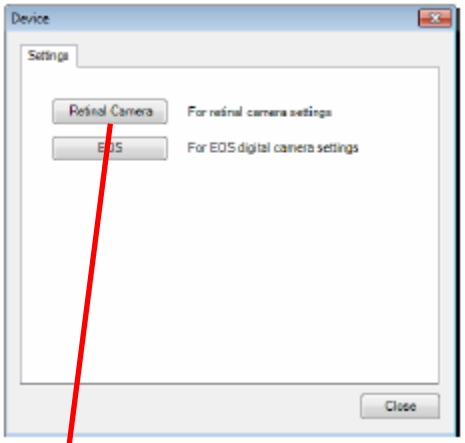
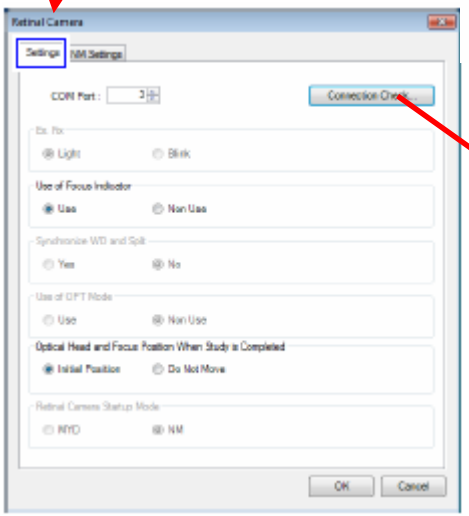
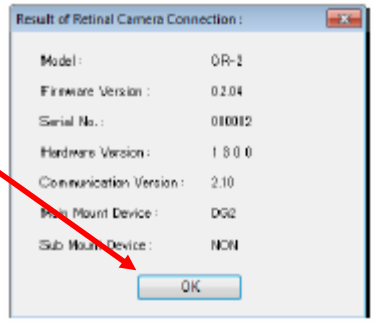
Setup and Configuration – Device



- **COM Port**
  Click ▲ button or ▼ button to select a number for the port where communication is made with the retinal camera (from 1 to 16).
- **Connection Check...**
  Click this button to check connections on the port you have set. If connection with the retinal camera has been made properly, the **Result of Retinal Camera Connection** screen appears.
- **Use of Focus Indicator**
  Selects whether or not to display the focus indicator.
- **Optical Head and Focus Position When Study is Completed**
  Selects whether or not to move the vertical position of the main unit and focus position to the initial position when study is completed.





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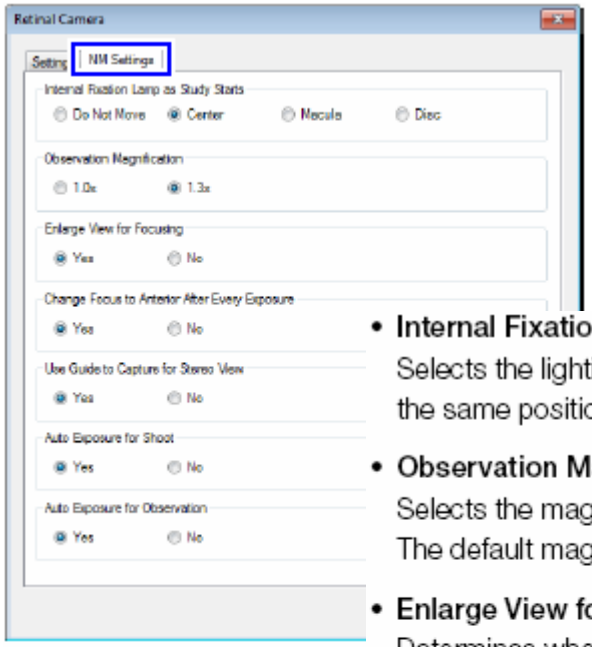
Setup and Configuration – Device



- **Internal Fixation Lamp as Study Starts**
  Selects the lighting position of the internal fixation lamp when the study starts. To keep the lamp at the same position as the last time, select **Do Not Move**.
- **Observation Magnification**
  Selects the magnification for observing the target eye on the observation monitor.
  The default magnification is 1.3x.
- **Enlarge View for Focusing**
  Determines whether or not to zoom in the image of the observation monitor when the focus knob is turned. To zoom in the image, select **Yes**, and to not zoom in, select **No**.
- **Change Focus to Anterior After Every Exposure**
  Selects whether or not to return to the anterior eye observation after the retinal image has been taken.
  This function is disabled in stereo photography even if **Yes** is selected.
- **Use Guide to Capture for Stereo View**
  To display the stereo guide mark on the observation monitor when the Capture for Stereo View mode is selected, select **Yes**, and to not display, select **No**.

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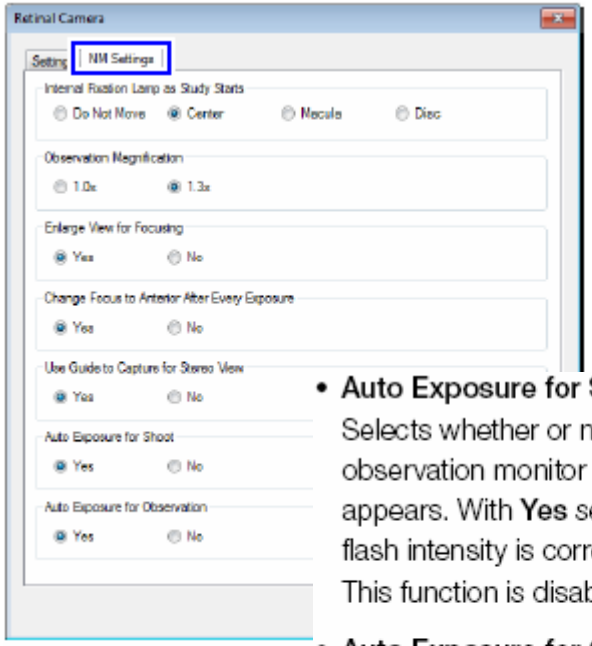
Setup and Configuration – Device



- **Auto Exposure for Shoot**

  Selects whether or not to automatically adjust the flash intensity. The setting appears as ϟ in the observation monitor of the retinal camera. When **Yes** is set, ON appears and when **No** is set, OFF appears. With **Yes** setting, every time the flash intensity button of the retinal camera is pressed the flash intensity is corrected by 0.3 stop.

  This function is disabled in anterior eye photography even if **Yes** is selected.

- **Auto Exposure for Observation**

  Selects whether or not to automatically adjust the observation light brightness. The setting appears as ☼ in the observation monitor of the retinal camera. When **Yes** is set, ON appears and when **No** is set, OFF appears. With **Yes** setting, every time the observation light brightness button of the retinal camera is pressed the observation light brightness is corrected by 0.3 stop.

  This function is disabled in anterior eye photography even if **Yes** is selected.

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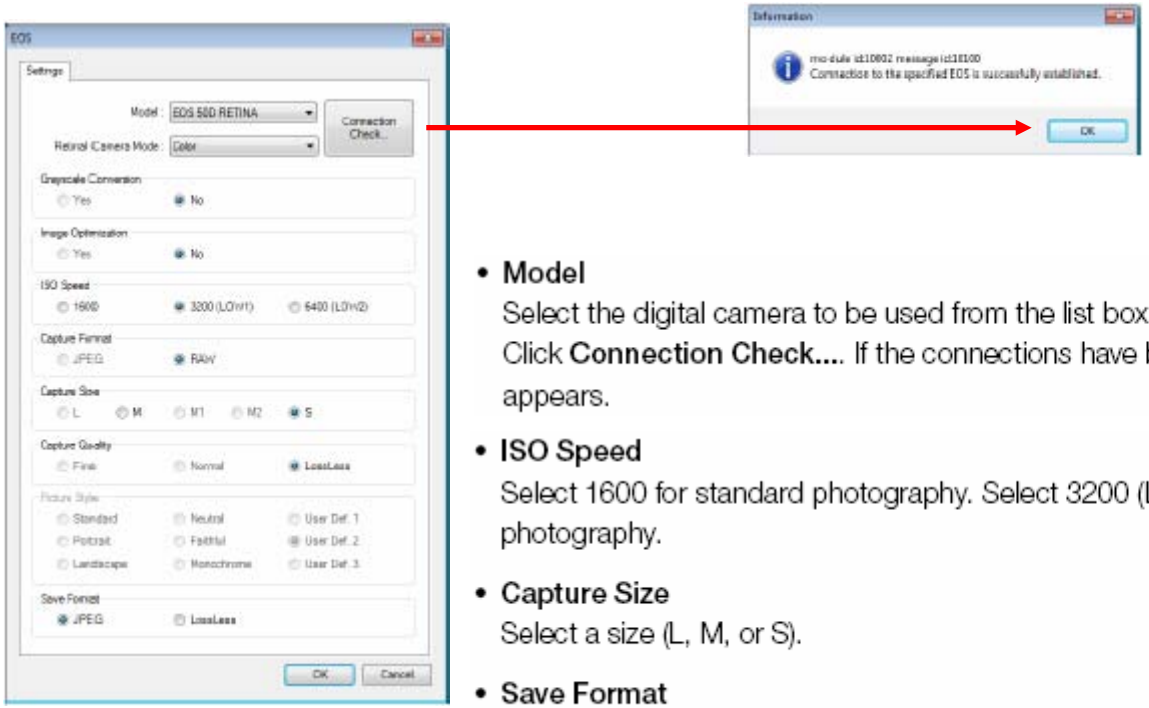
Setup and Configuration – Device



- **Model**
  Select the digital camera to be used from the list box.
  Click **Connection Check...**. If the connections have been made properly, the **Information** screen appears.
- **ISO Speed**
  Select 1600 for standard photography. Select 3200 (LOW1) or 6400 (LOW2) for low flash intensity photography.
- **Capture Size**
  Select a size (L, M, or S).
- **Save Format**
  Select the image format for saving.

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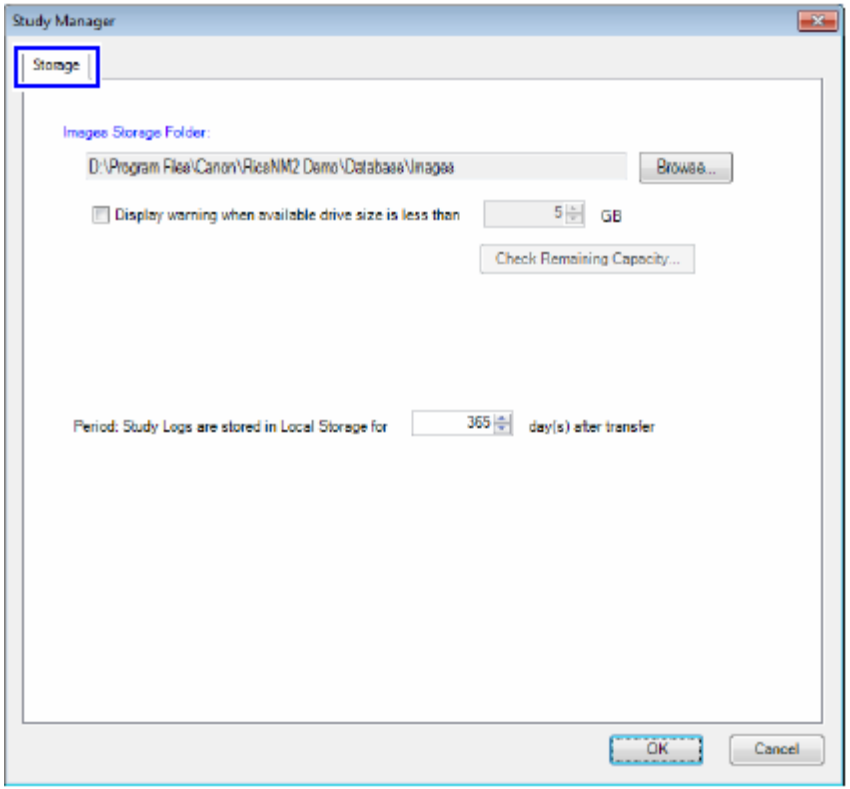
Setup and Configuration – Study Manager



- **Image Storage Folder**
  Specify any location on the local hard disk for storing the study data. Network drives and removable drives, such as DVD-R/RW, DVD-RAM, CD-R/RW, and USB flash drive, cannot be selected as the image storage folder.

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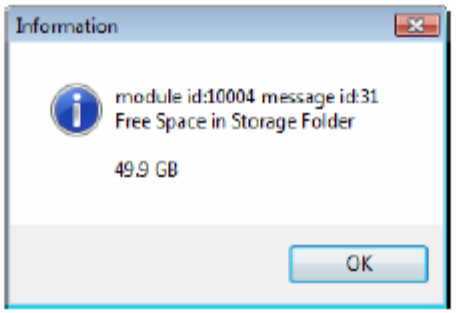
Setup and Configuration – Study Manager

- **Display warning when available drive size is less than**
  Select this item to display a warning screen when free space on the hard disk has fallen below the setting. Specify a value from 5 to 999 GB.
  When free space falls to 1 GB or less, the **Error** screen appears. Click **Check Remaining Capacity** to check the remaining free space on the hard disk and display the **Information** screen.



- **Period: Study Logs are stored in Local Storage for**
  When the set number of days elapses after the study data transfer date, the study data is deleted.
  If a study targeted for deletion exists when you log out, the delete confirmation screen appears.
  Delete by following the displayed instructions.
  Specify a value from 0 to 999 days.
  Example: If this period is set to 5 days and you transfer study data on September 2, 2010, the study data is targeted for deletion at 00:00 on September 7, 2010.

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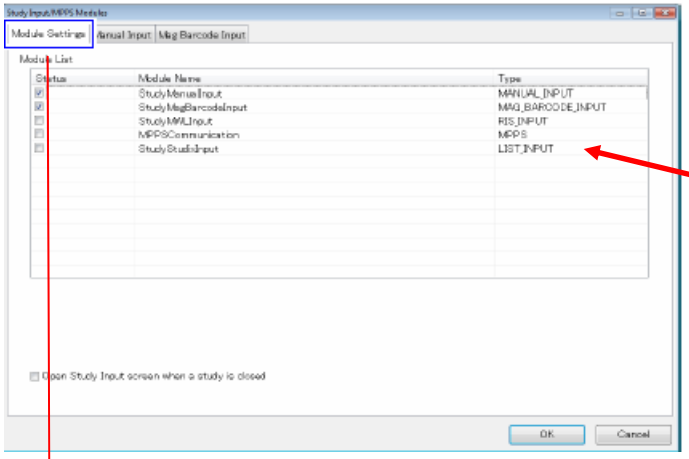
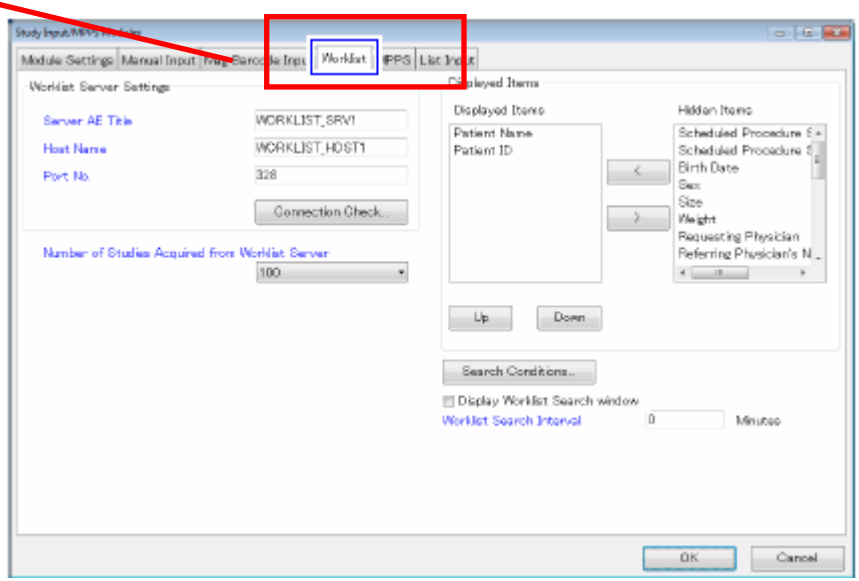
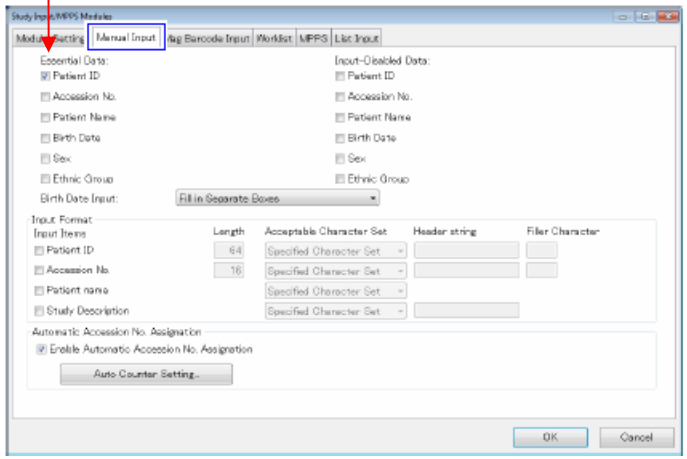
Setup and Configuration – Study Input

To select study input, Manual or Worklist, and enable MPPS



Tab selections available only when modules are enable.





To select essential patient information during registration of patient using manual input instead of worklist.

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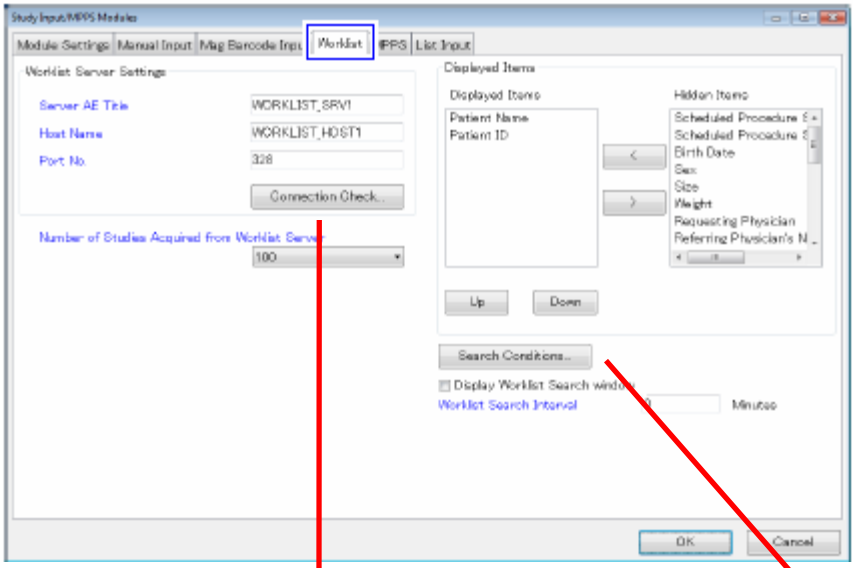
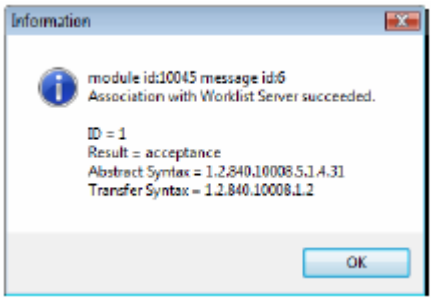
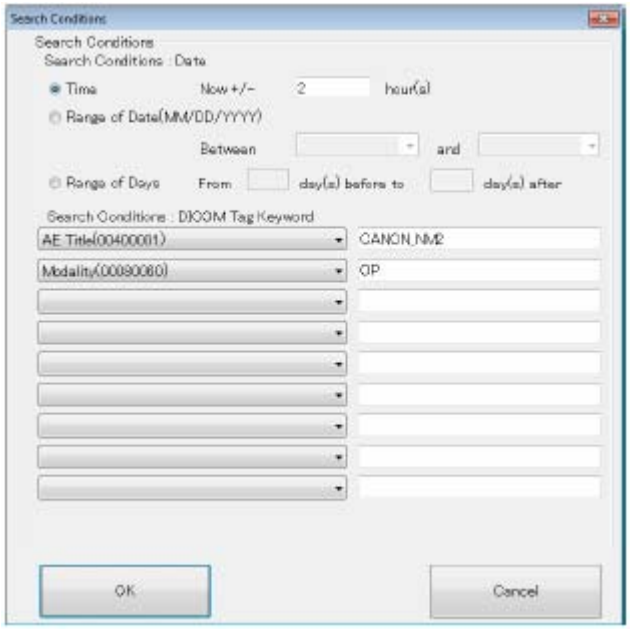
Setup and Configuration – Worklist





To receive work list from worklist SCP.

Provide:
-IP Addr / Hostname
-AET
-Port Number
-Search Conditions
-Search Interval



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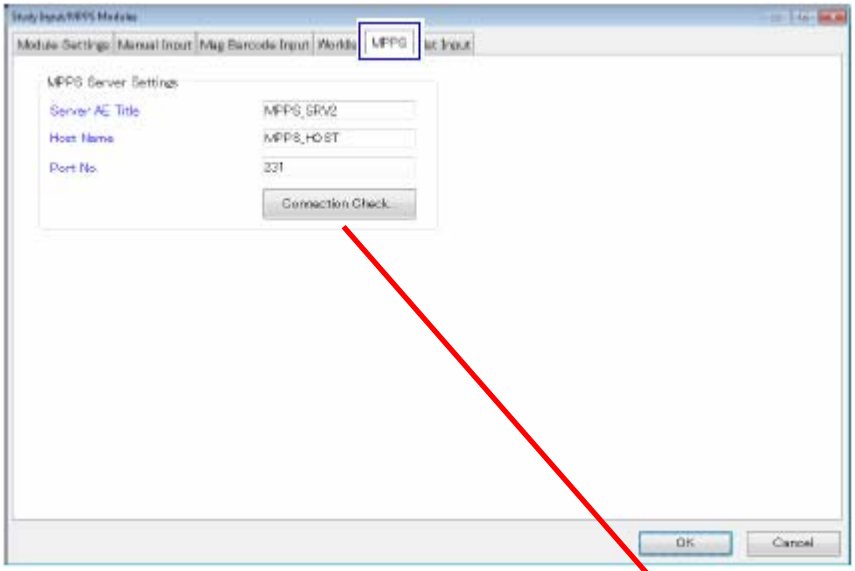
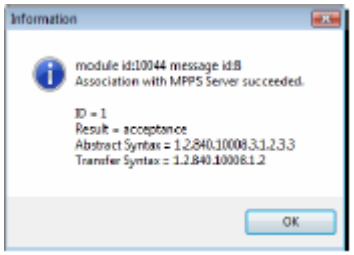
Setup and Configuration – MPPS





To send study status to MPPS SCP.

Provide:
-IP Addr / Hostname
-AET
-Port Number

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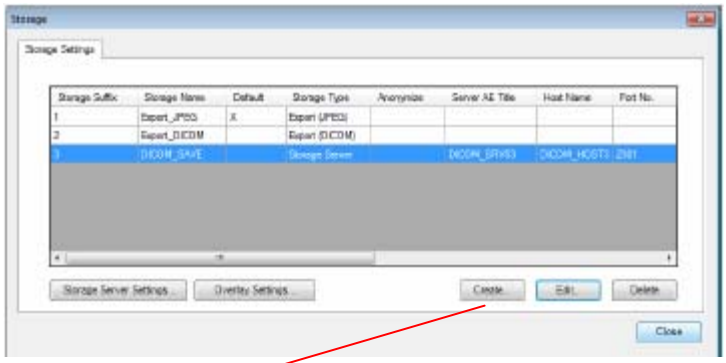
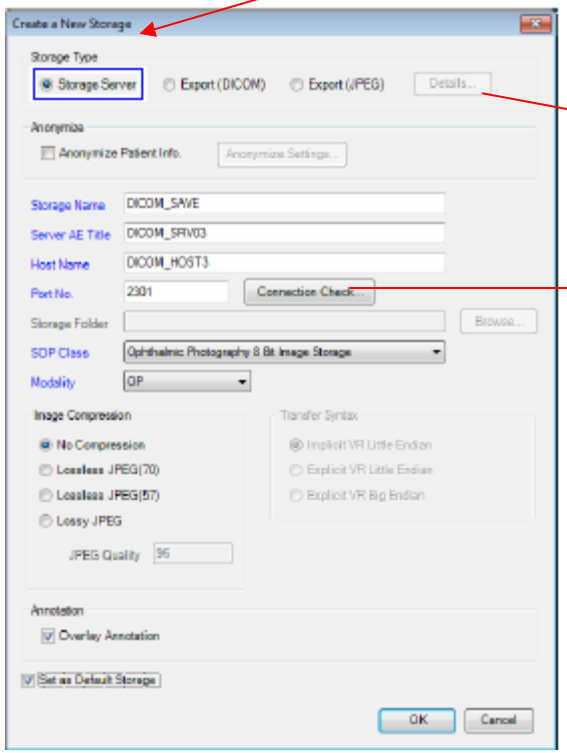
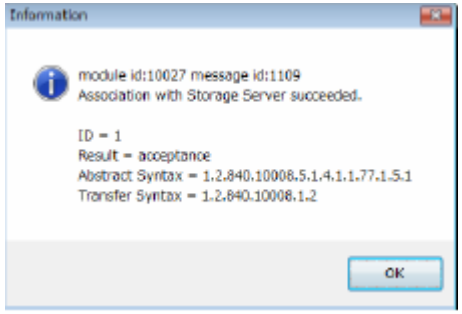
Setup and Configuration – Storage

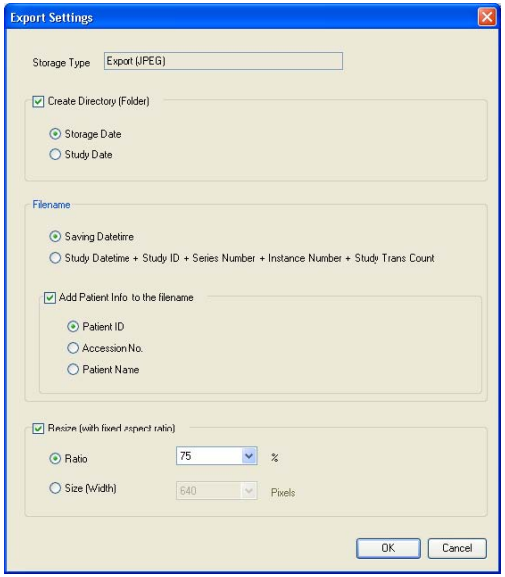


To send image to Storage SCP.
Provide:
-Storage name
-IP Addr / Hostname
-AET
-Port Number
-SOP Class

To export image – dcm or jpg format.
Provide:
-Storage name
-Storage directory
-SOP Class







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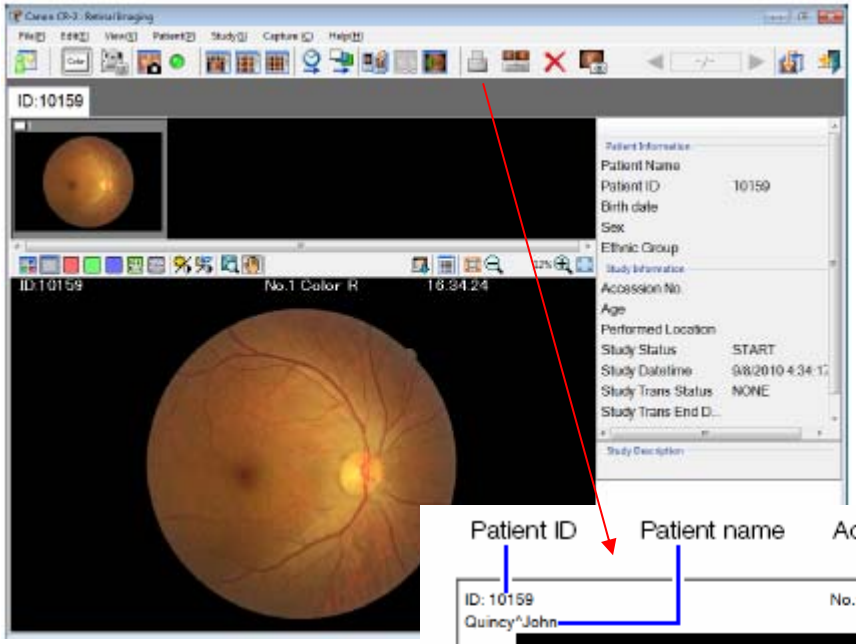
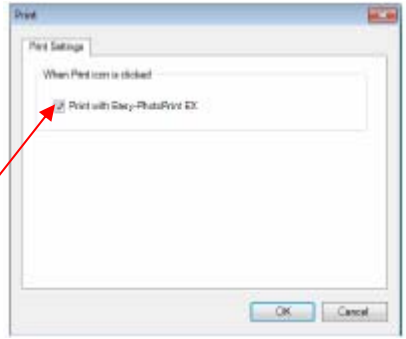
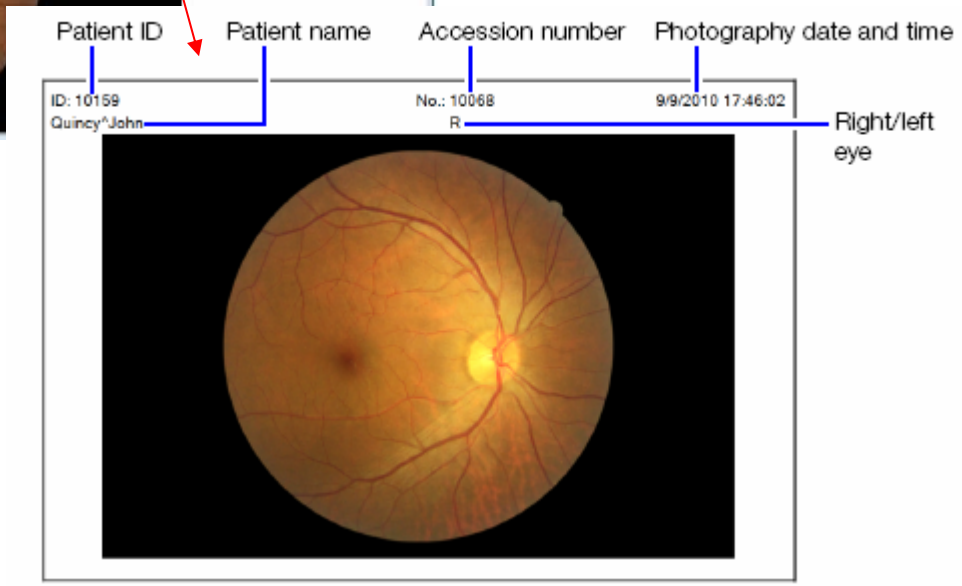
Setup and Configuration – Simple Print





Un-check to use Printing Icon for simple print.



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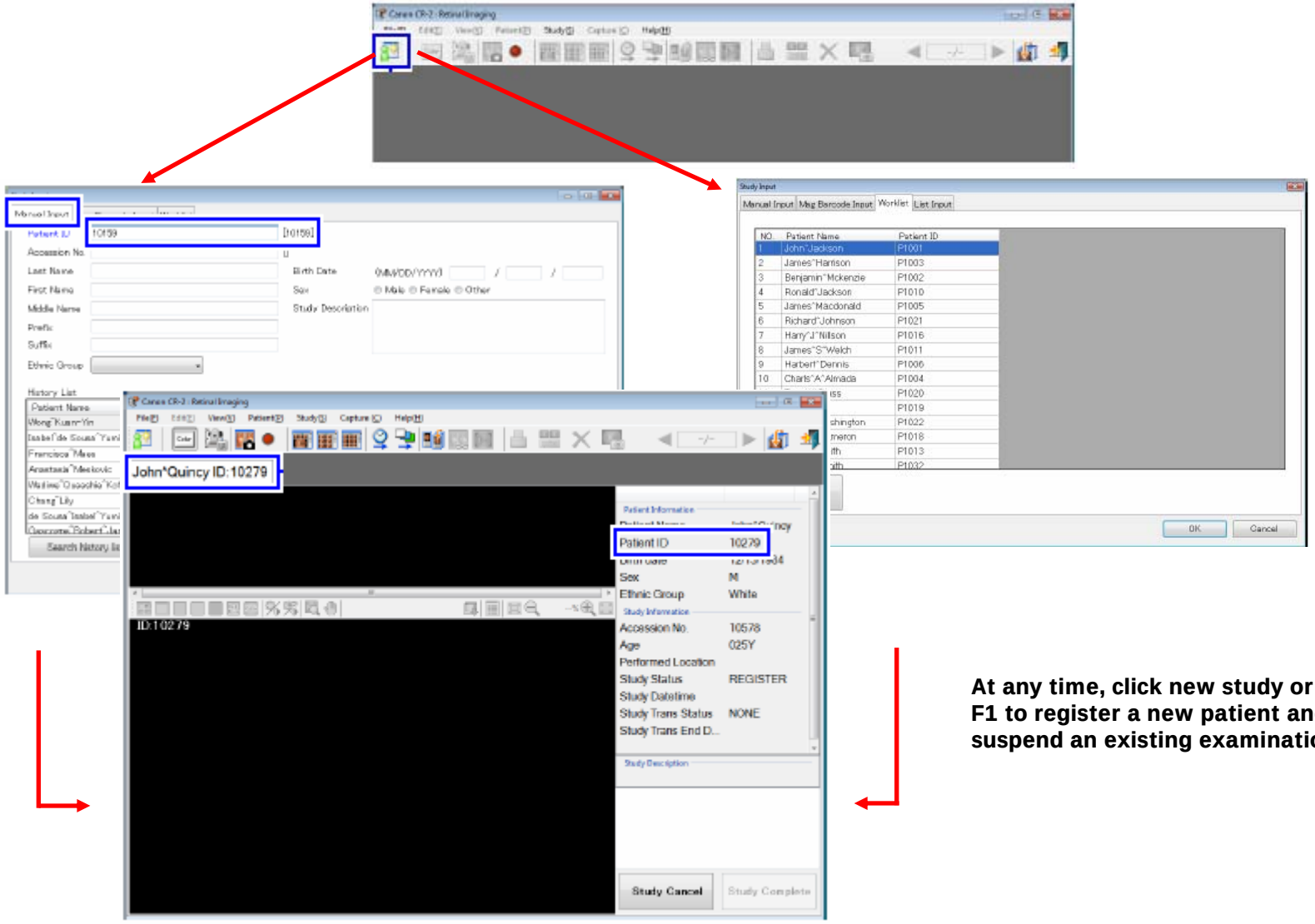
Operation – Manual Patient Registration



At any time, click new study or F1 to register a new patient and suspend an existing examination.

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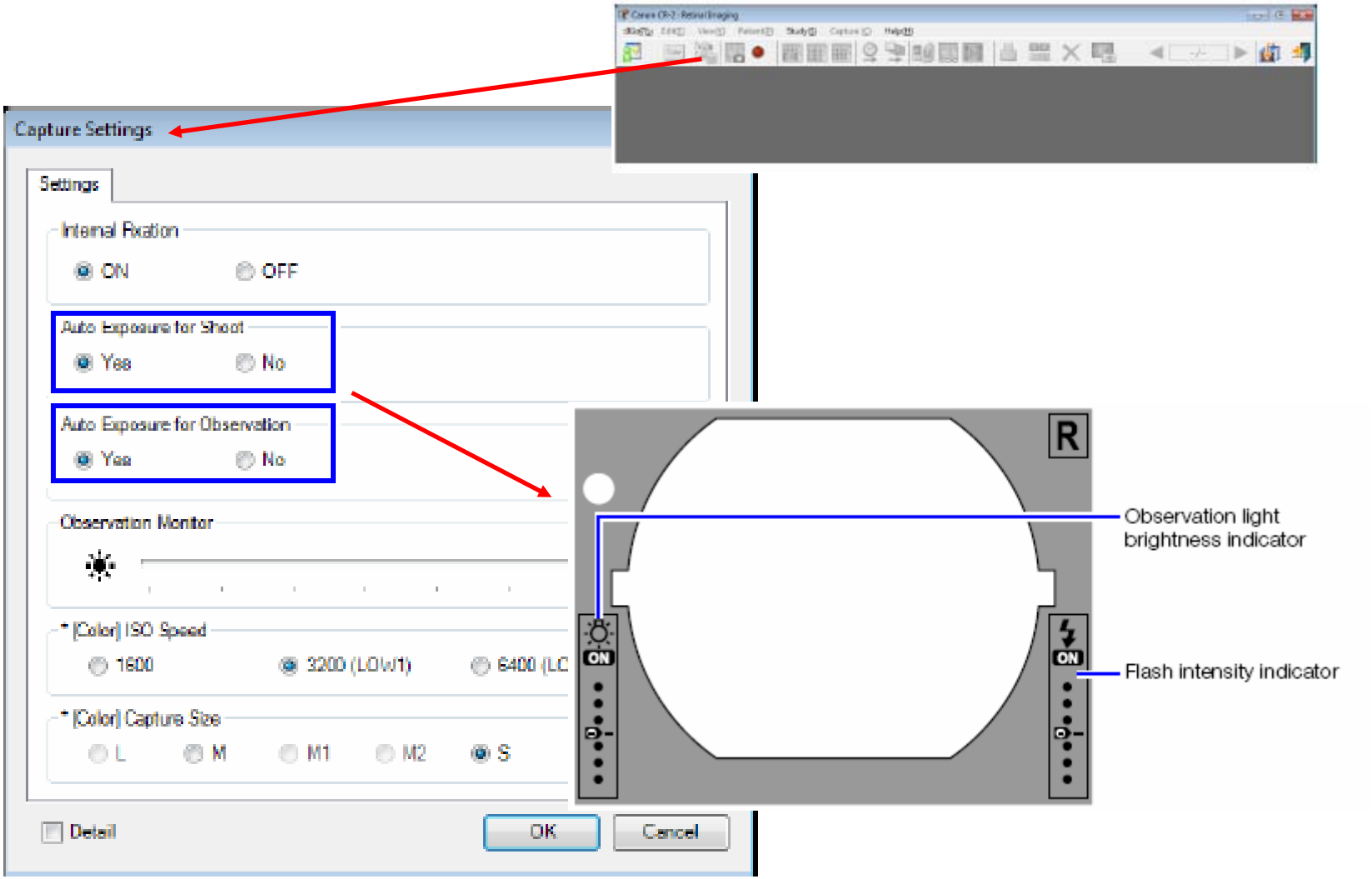
Operation – Automatic Exposure (AE)



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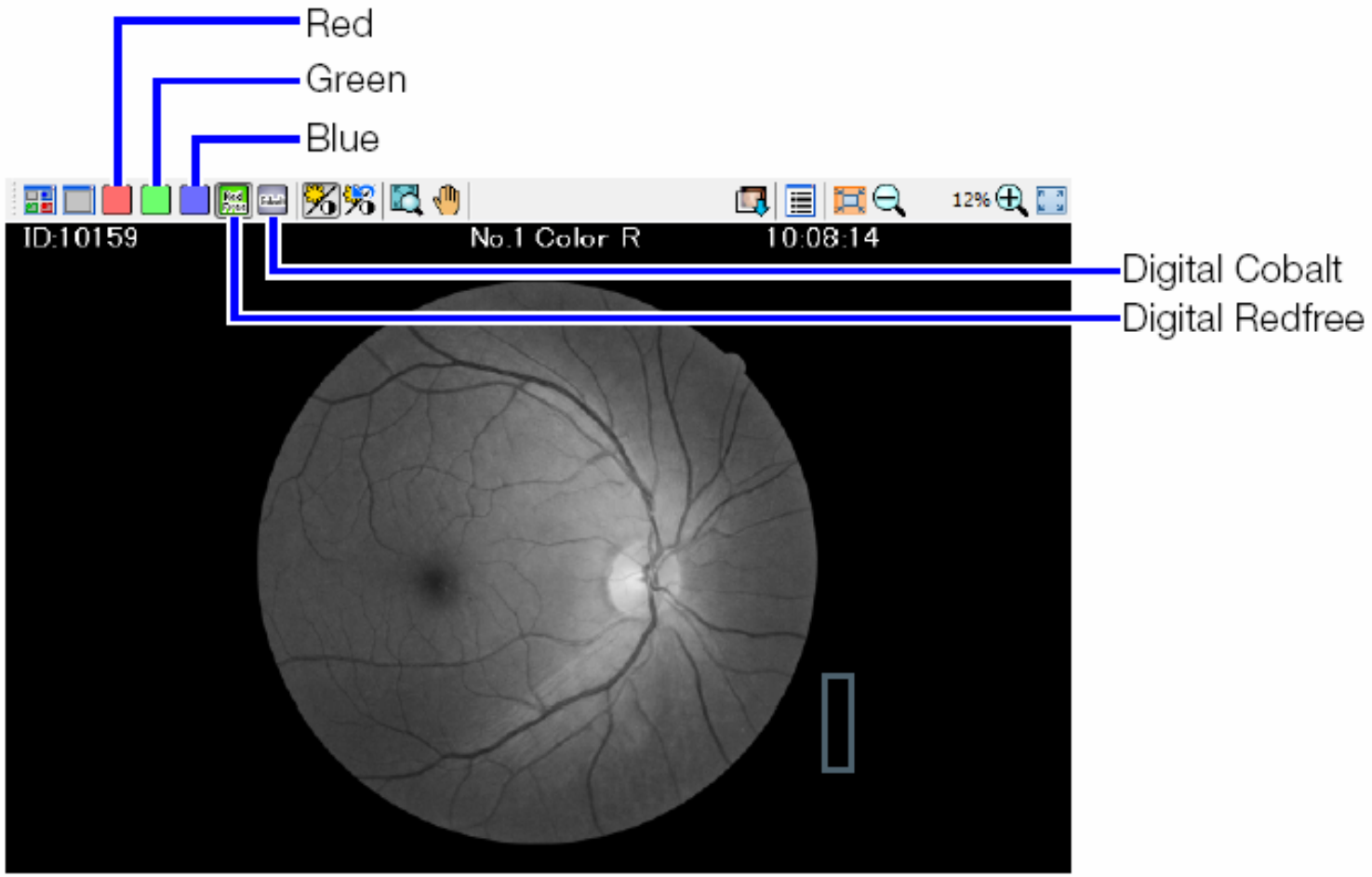
Operation – Image Adjustment



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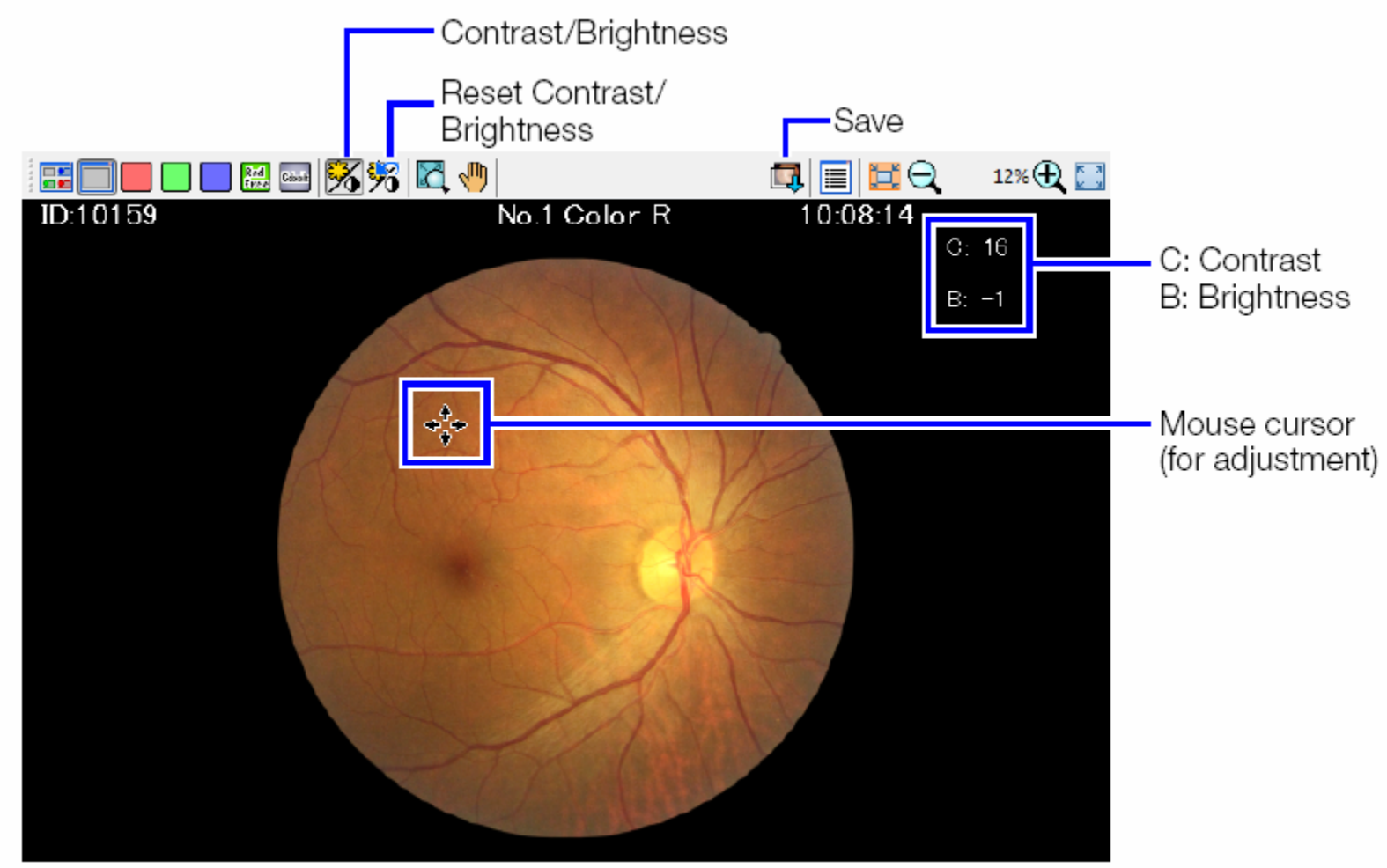
Operation – Image Adjustment



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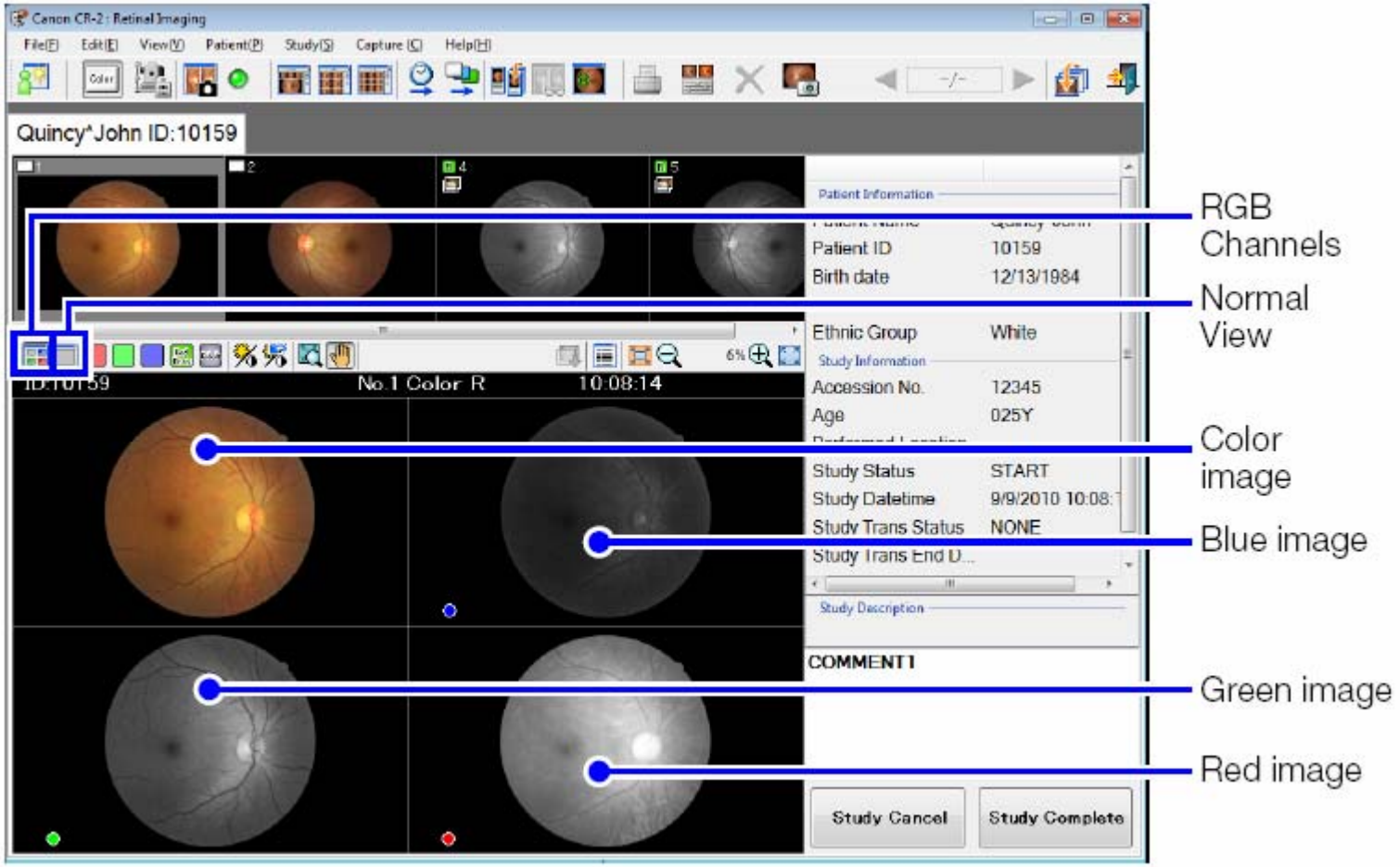
Operation – Image Adjustment



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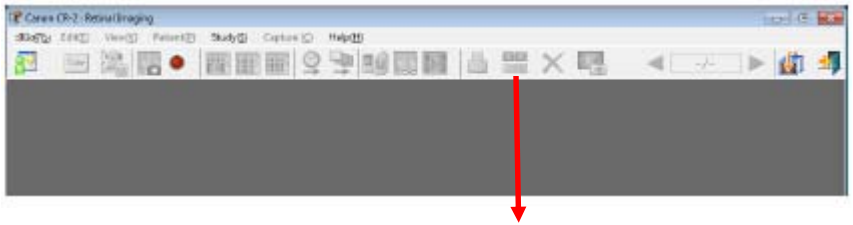
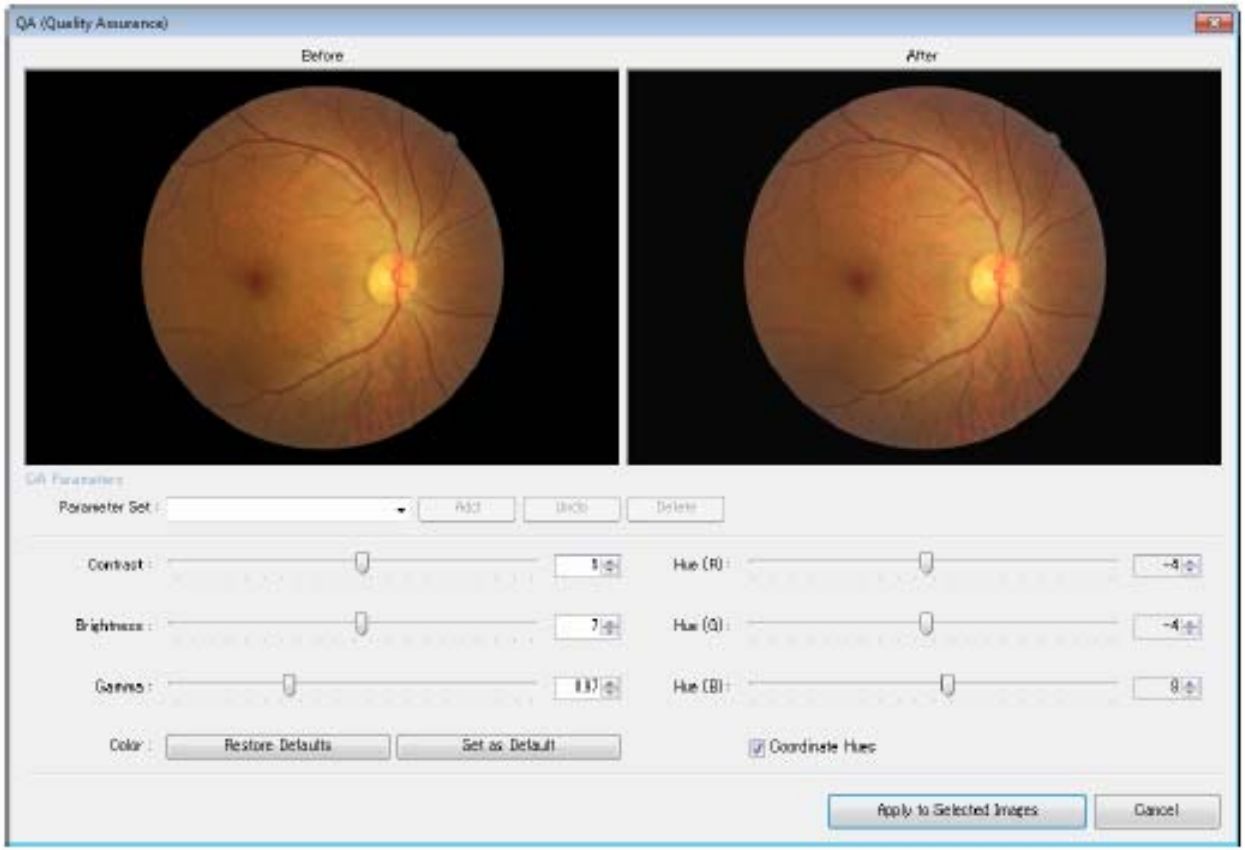
Operation – QA Setting





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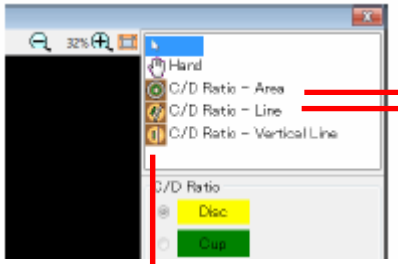
Operation – C/D Ratio Measurement



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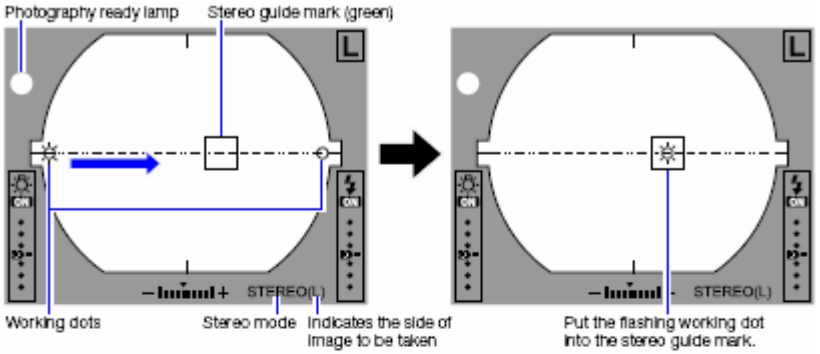
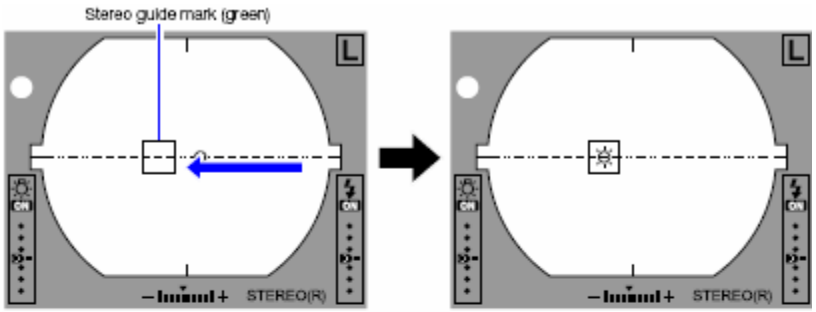
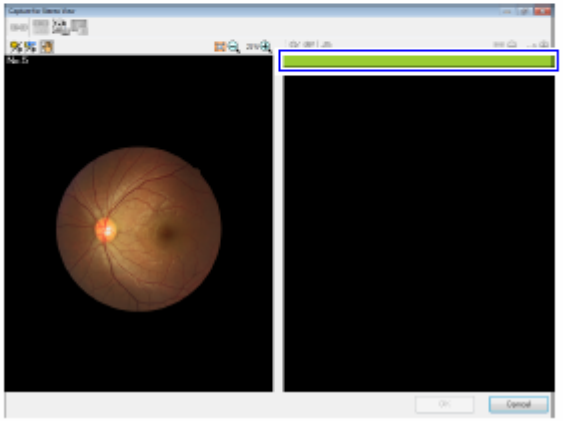
Operation – Stereo Photography

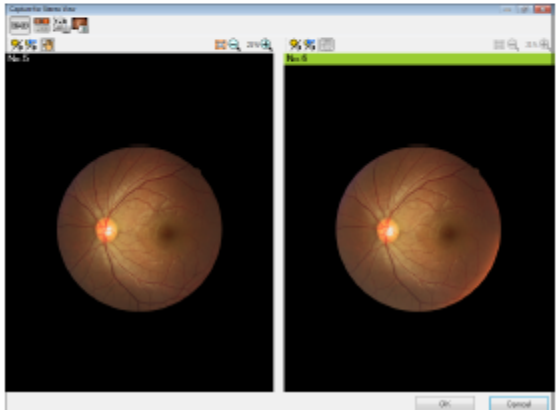




The left side stereo image appears on the left side of the Capture for Stereo View screen.



The right side stereo image appears on the right side of the Capture for Stereo View screen. To take the image again, click the side of the image to be taken, and then take the image. The previous image will not appear. However, all the images will remain in the thumbnail image area.



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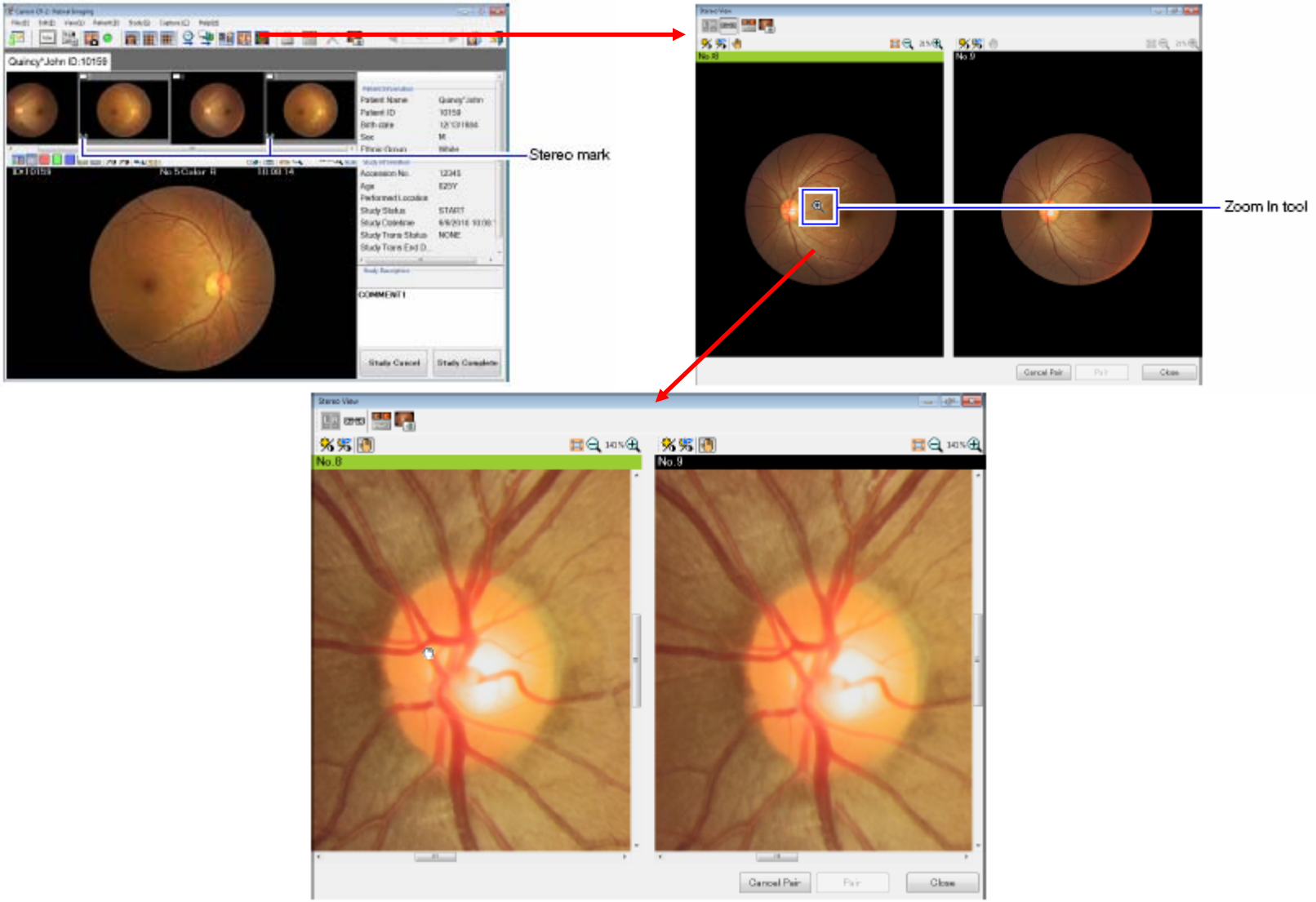
Operation – Stereo Photography Review



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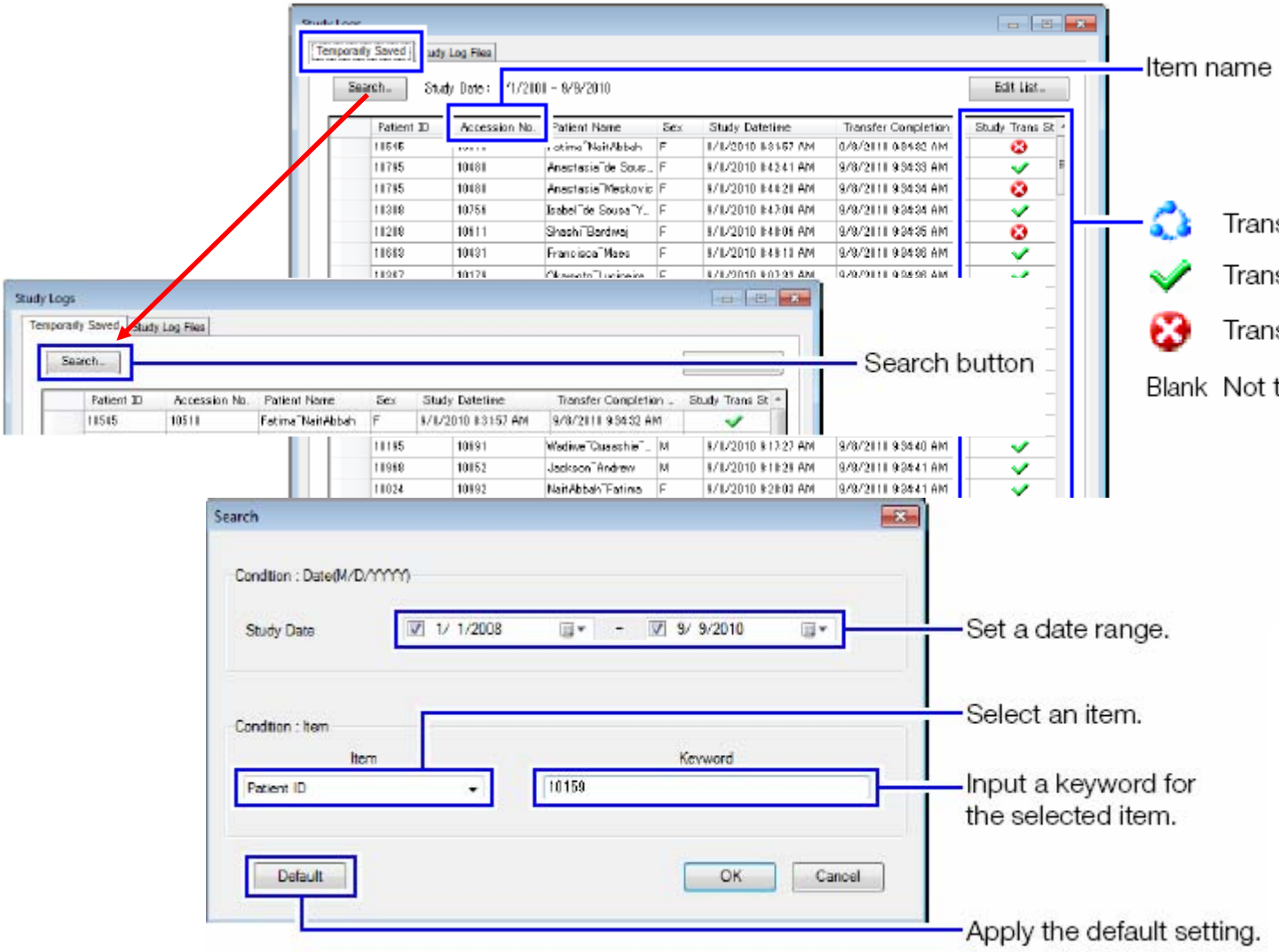
Operation – Study Log



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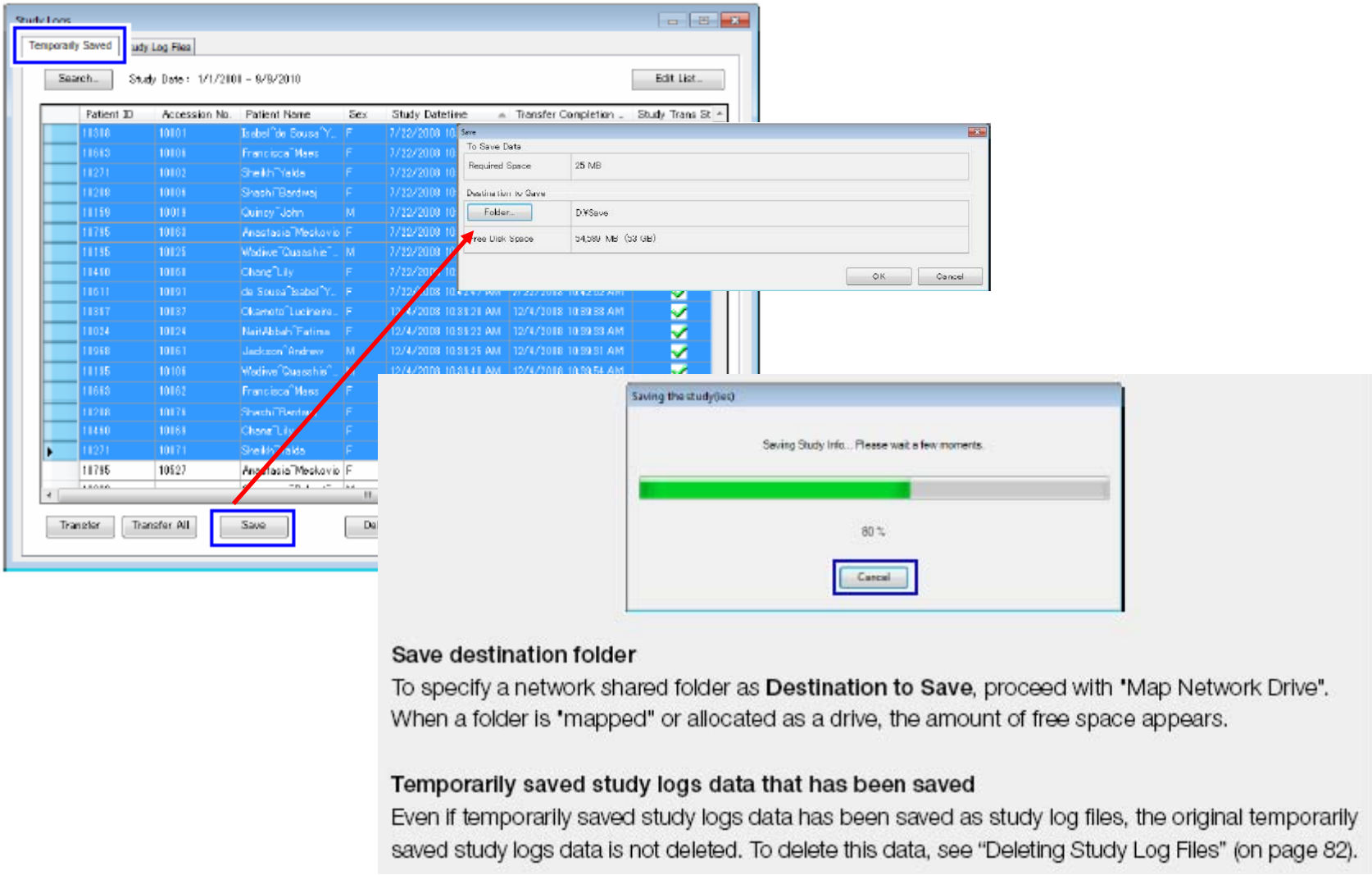
Operation – Study Log



Save destination folder

To specify a network shared folder as **Destination to Save**, proceed with "Map Network Drive". When a folder is "mapped" or allocated as a drive, the amount of free space appears.

Temporarily saved study logs data that has been saved

Even if temporarily saved study logs data has been saved as study log files, the original temporarily saved study logs data is not deleted. To delete this data, see "Deleting Study Log Files" (on page 82).

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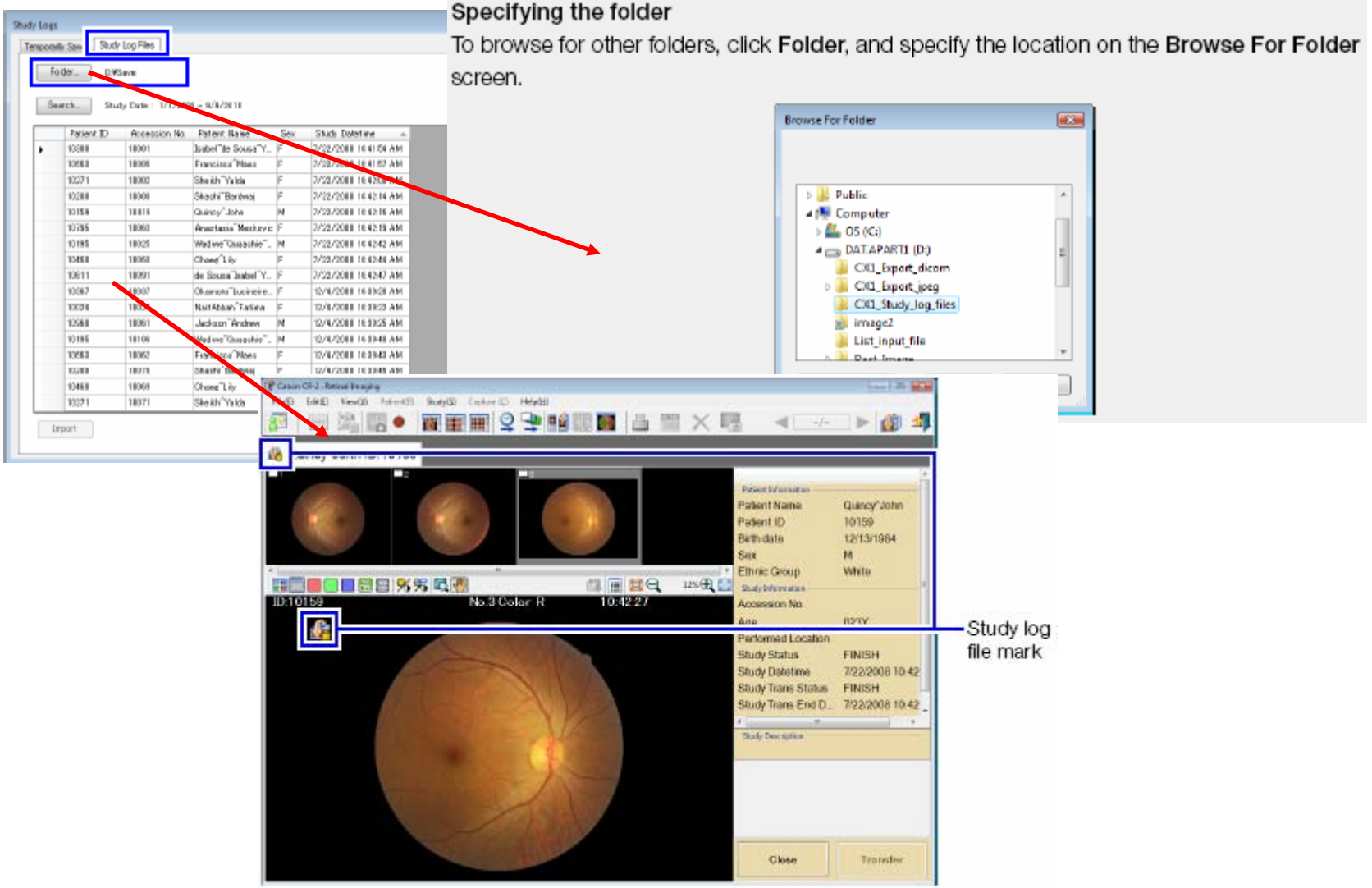
Operation – Study Log

Specifying the folder

To browse for other folders, click **Folder**, and specify the location on the **Browse For Folder** screen.



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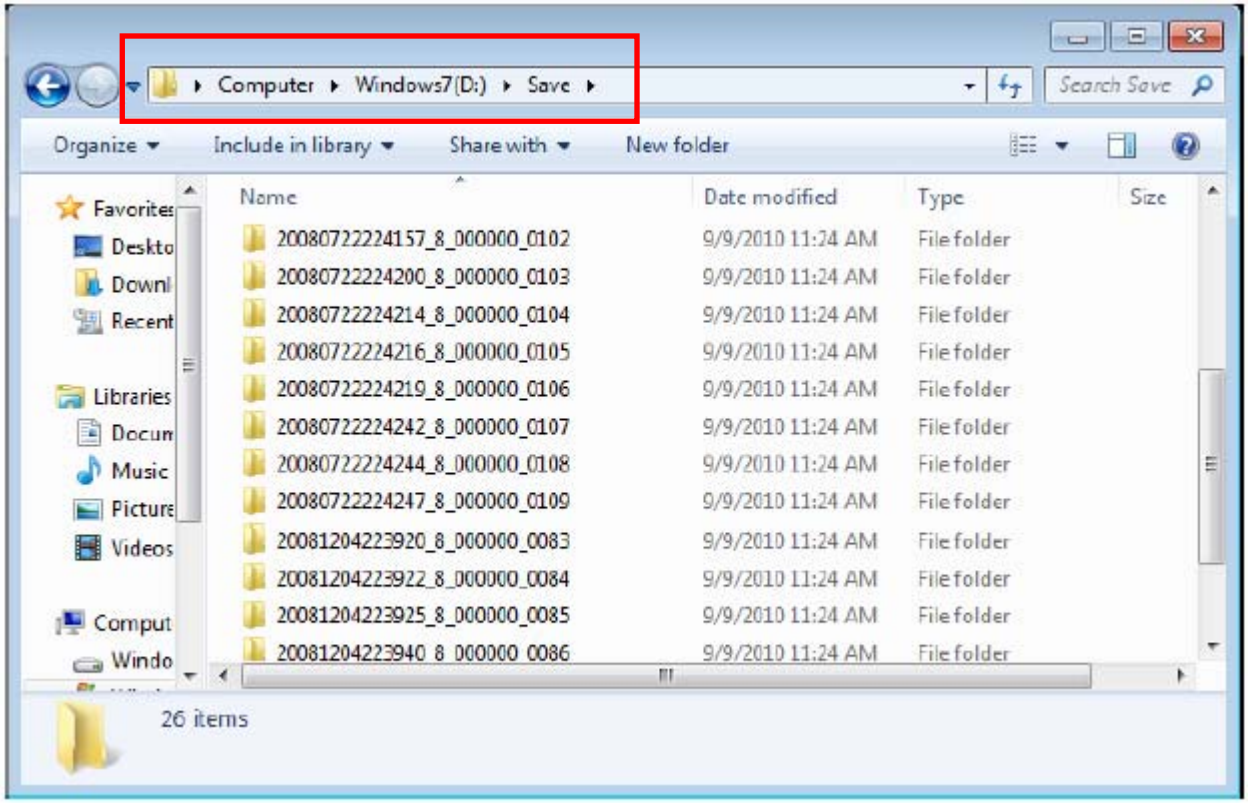
Operation – Study Log



Select the the folder of the study log file to be deleted, and press the Delete key.

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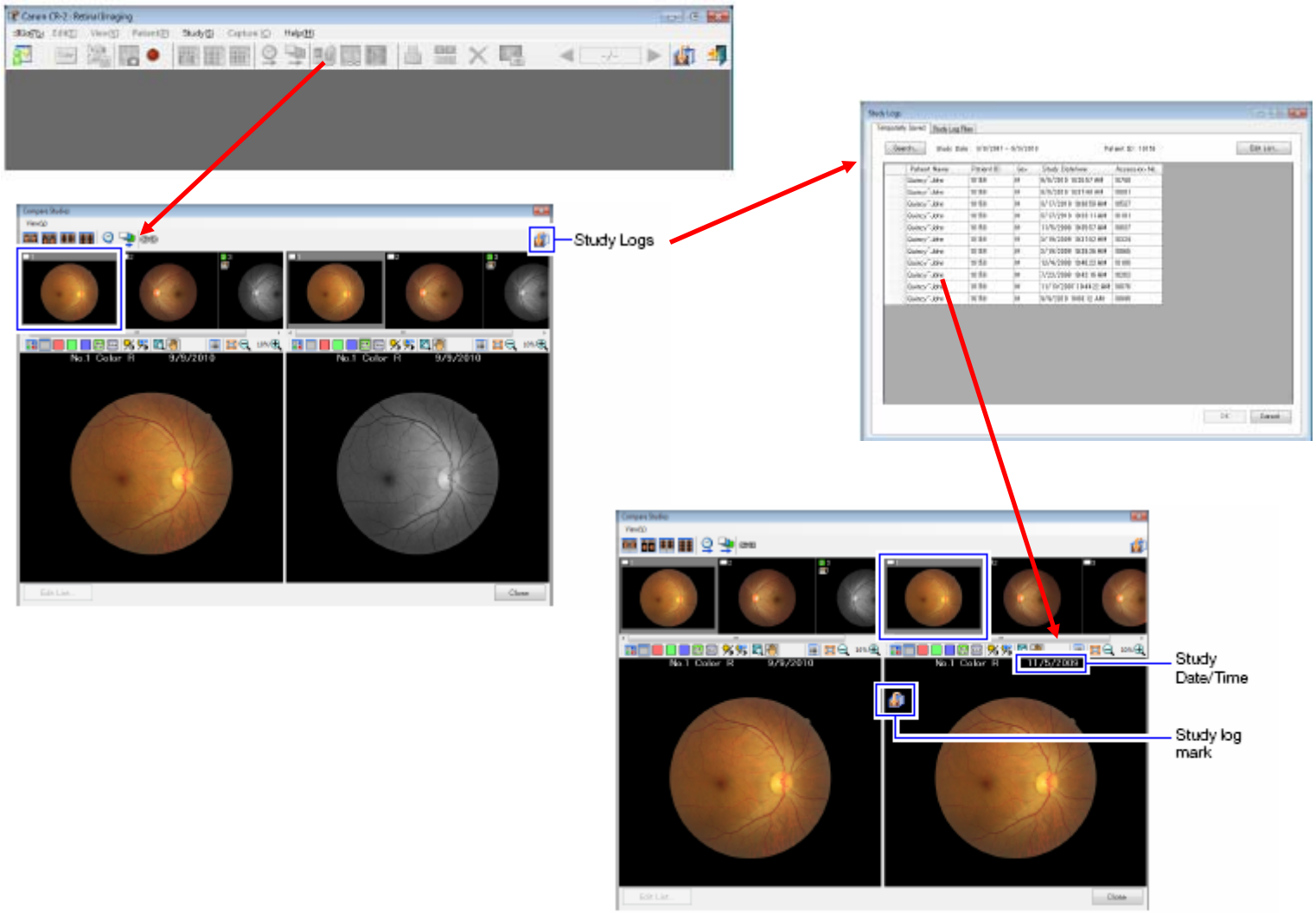
Operation – Study Log (Compare)



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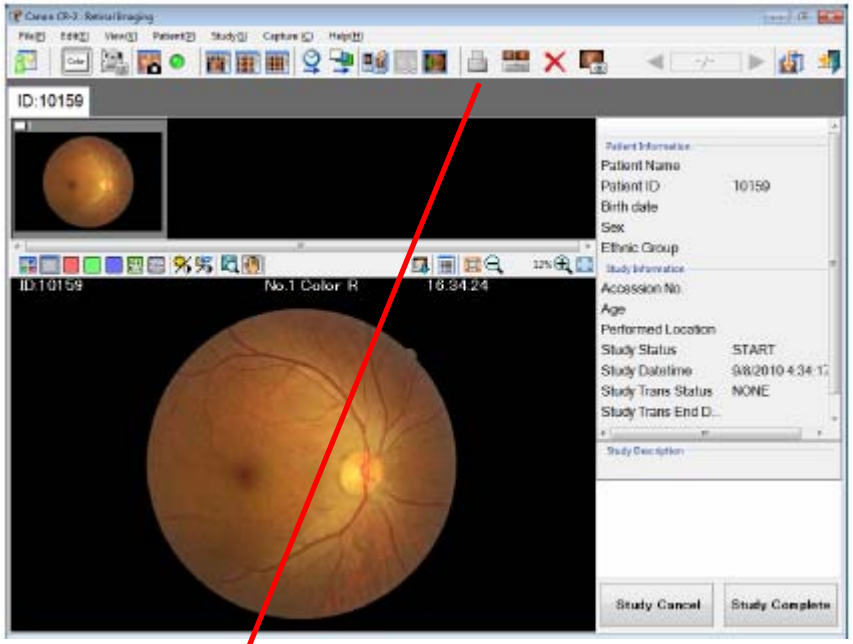
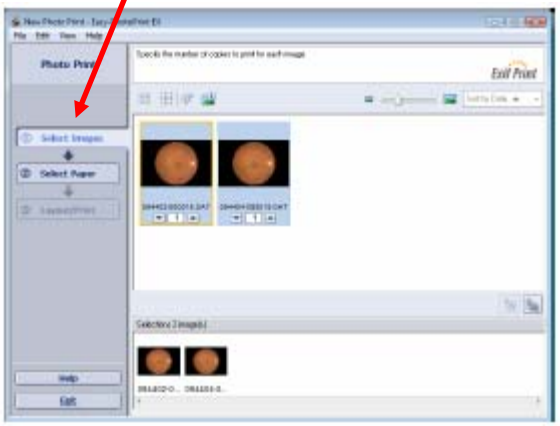
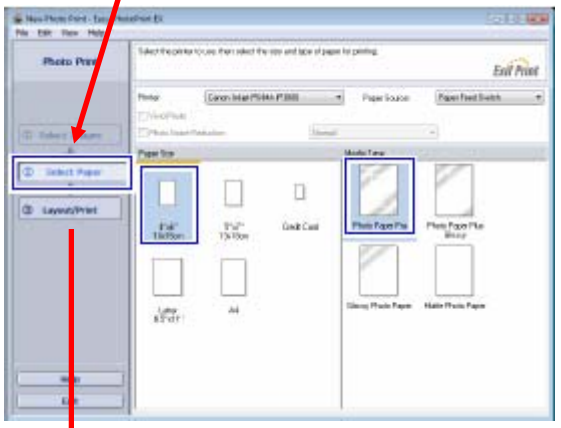
Operation – Easy PhotoPrint EX







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Operation – Printers

PIXMA iP1880

PIXMA iP3300

PIXMA iP3500

PIXMA iP4500

PIXMA iP4200

PIXMA iP5280

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Operation – Paper

Photo Print
Glossy
Non-glossy
Printing with best image quality. Longer image life
PR-101 Photo Paper Pro
Printing with good image quality
PP-101 Photo Paper Plus Glossy
Printing Double-sided photo
SP-101D Photo Paper Plus Double Sided
Everyday photo printing
GP-401 Glossy Photo
Small-Size Photo Printing to Carry Around
EC-101C Glossy Photo Paper GP-401 Credit Card Size
Creating an Original Double-Sided Album
PAK-101 Photo Album Kit
Photo Printing with Matte Photo with reduced glossiness
SG-101 Photo Paper Plus Semi-gloss
Non-Glossy. Matte Finish
MP-101 Matte Photo Paper

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Tool Mode – Functions

The CR-2 tool software has the functions below.

1) Optical adjustment
2) UP/down movement unit adjustment
3) Capture light intensity adjustment
4) LED light intensity adjustment
5) Reading, file output, and writing of correction data
6) Other (shipping reset, adjustment data initialization)
7) Reading and reset of service information
8) Firmware version

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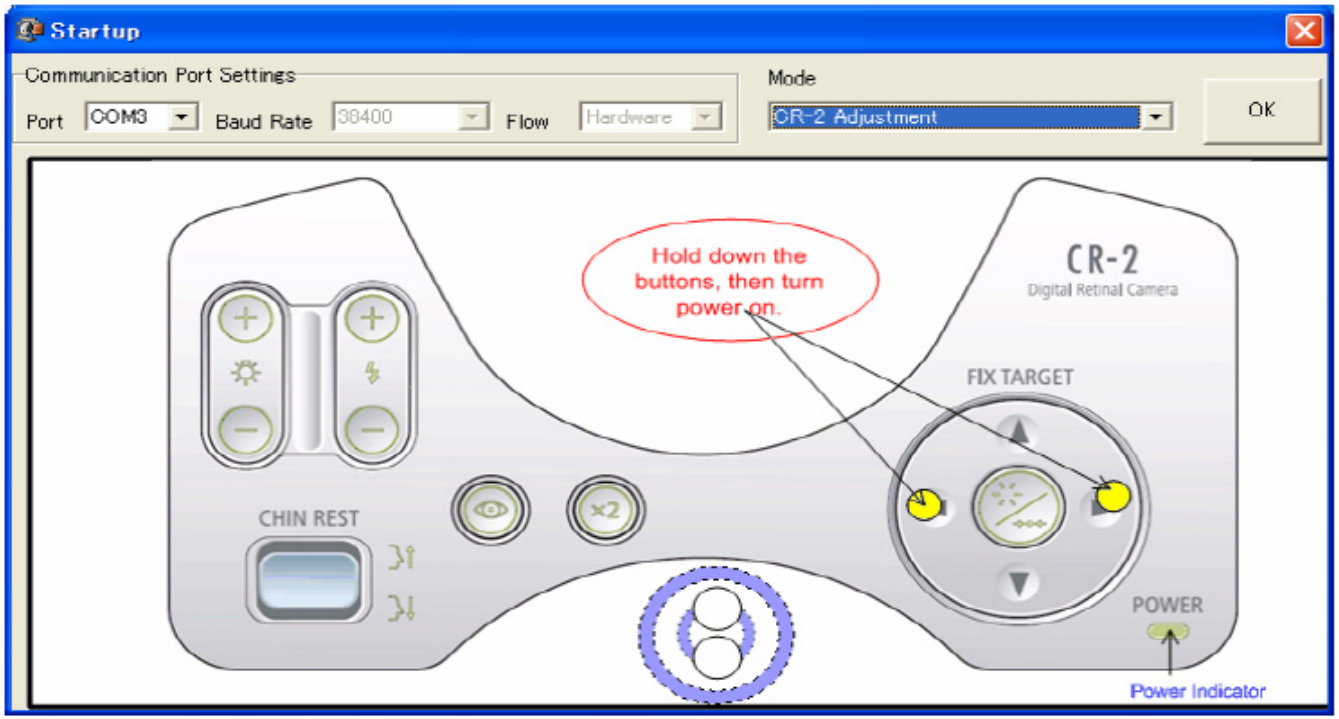
Tool Mode – Setup

When the tool software is started, it appears as shown in the figure below. Check the communication port (connection port with the CR-2 is automatically recognized, but it can be changed if necessary), select "CR-2 Adjustment" by the mode, and press the OK button. To exit, click the × button at the top right.
Operation is performed at a baud rate of 38400 (fixed), and flow control is set to Hardware (fixed).



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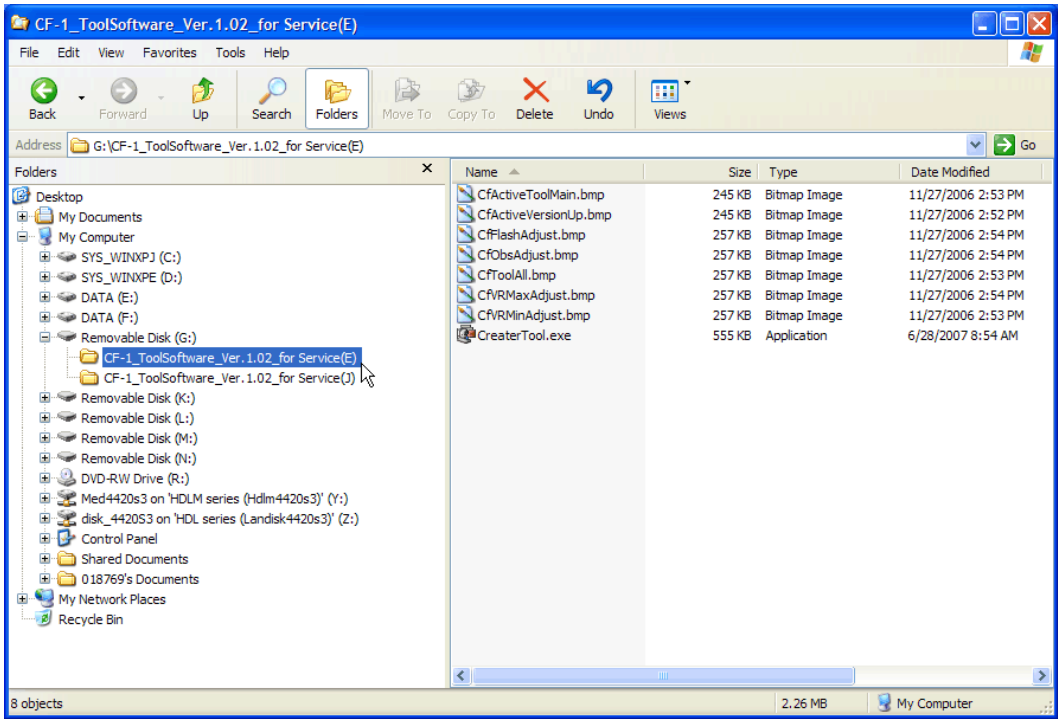
Tool Software – Installation

1. Tool software - CreaterTool.exe.
2. The tool software can run from the local hard drive of the CR-2 Control PC installed at site but it is recommended that the software is launched from a USB flash memory.
3. If it is run from the local hard drive. Delete the tool software after use to prevent unnecessary problems.



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Tool Software – Startup Settings

[1]: Port

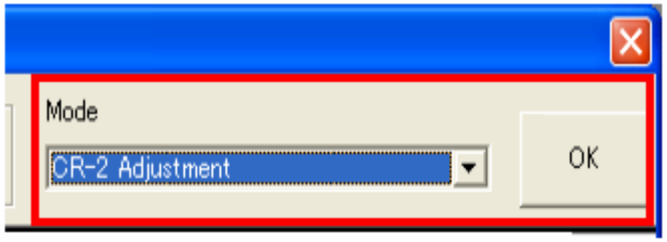
Check the number of the COM port on the PC used for serial communication with the CR-2 retinal camera.

[2]: Baud Rate

Check that the baud rate during serial communication is 38400 bps.

[3]: Mode

Select “CR-2 Adjustment” or “CR-2 Firmware Update”.



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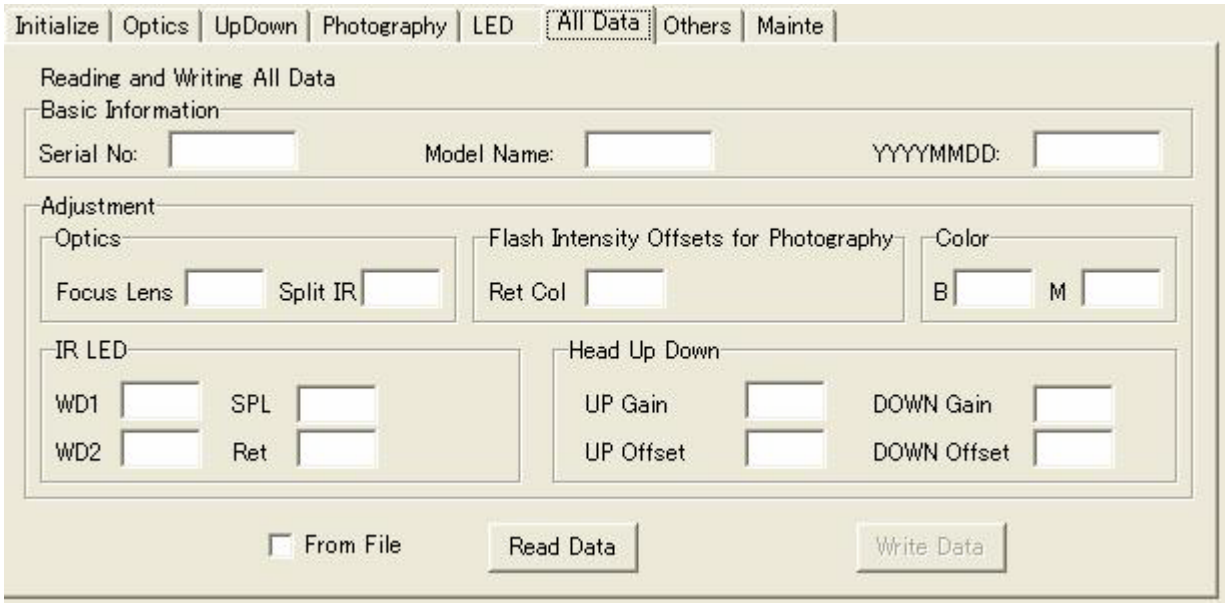
Tool Software – All Data Screen

All the fixed value for the CR-2 retinal camera written into the FRAM on the main board are captured and displayed here. A fixed value file (txt) is generated concurrently. It is also available to write the values of the fixed file (txt) into the FRAM on the main board here.



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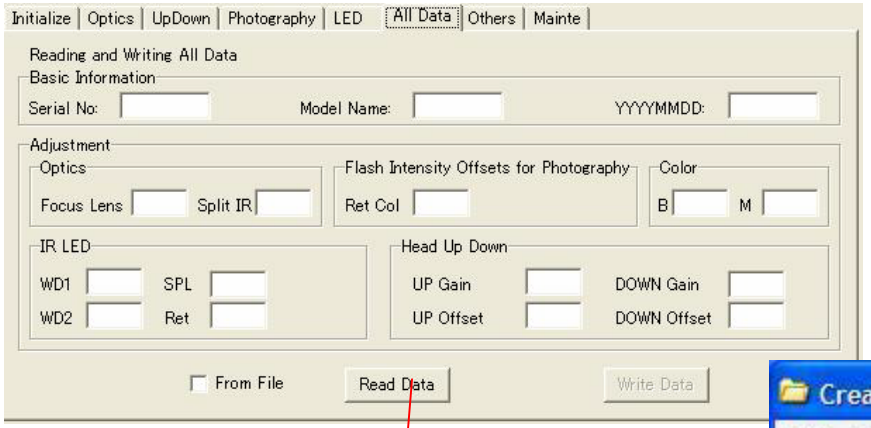
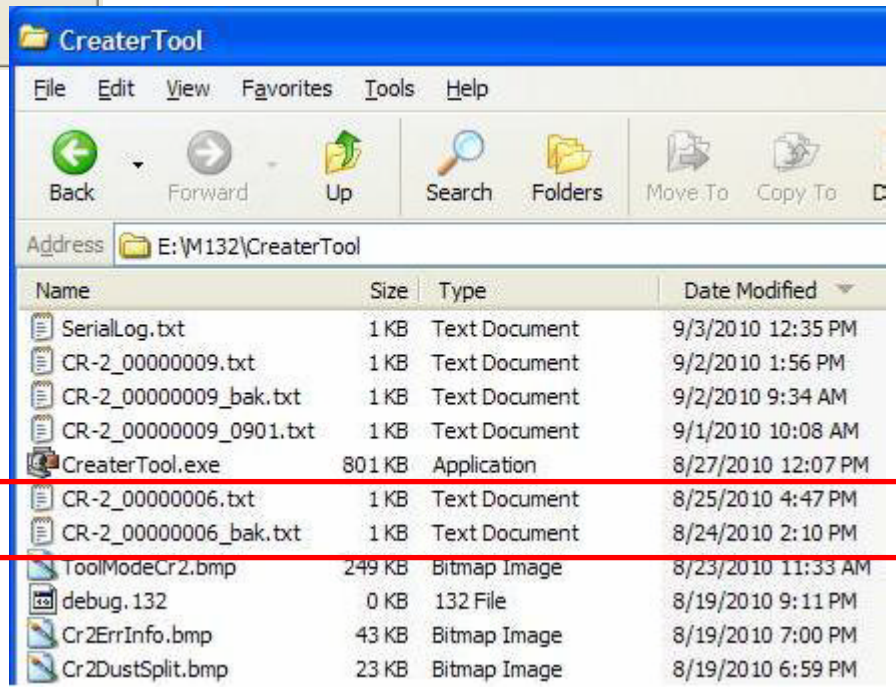
Tool Software – All Data Screen (Read)



*If the same file name already exists, the file name for the new generated fixed value file (txt) will have "_bak" at the end of it.


CreaterTool
File Edit View Favorites Tools Help
Back Forward Up Search Folders Move To Copy To
Address E:\M132\CreaterTool
Name Size Type Date Modified
SerialLog.txt 1 KB Text Document 9/3/2010 12:35 PM
CR-2_00000009.txt 1 KB Text Document 9/2/2010 1:56 PM
CR-2_00000009_bak.txt 1 KB Text Document 9/2/2010 9:34 AM
CR-2_00000009_0901.txt 1 KB Text Document 9/1/2010 10:08 AM
CreaterTool.exe 801 KB Application 8/27/2010 12:07 PM
CR-2_00000006.txt 1 KB Text Document 8/25/2010 4:47 PM
CR-2_00000006_bak.txt 1 KB Text Document 8/24/2010 2:10 PM
ToolModeCr2.bmp 249 KB Bitmap Image 8/23/2010 11:33 AM
debug.132 0 KB 132 File 8/19/2010 9:11 PM
Cr2ErrInfo.bmp 43 KB Bitmap Image 8/19/2010 7:00 PM
Cr2DustSplit.bmp 23 KB Bitmap Image 8/19/2010 6:59 PM

File name:C R 2 _ 0 0 X X X X X X .txt

↑ ↑

Product name (Fixed) Serial number(6-digit)

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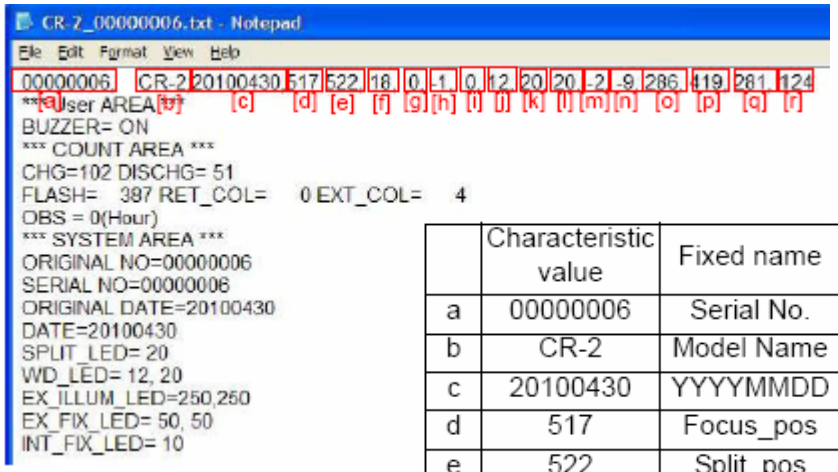
Tool Software – All Data Screen (Read)


CR-Z_00000006.txt - Notepad
File Edit Format View Help
00000006 CR-2 20100430 517 522 18 0 -1 0 12 20 20 -2 -9 286 419 281 124
[a] [b] [c] [d] [e] [f] [g] [h] [i] [j] [k] [l] [m] [n] [o] [p] [q] [r]
**** User AREA ****
BUZZER= ON
*** COUNT AREA ***
CHG=102 DISCHG= 51
FLASH= 387 RET_COL= 0 EXT_COL= 4
OBS = 0(Hour)
*** SYSTEM AREA ***
ORIGINAL NO=00000006
SERIAL NO=00000006
ORIGINAL DATE=20100430
DATE=20100430
SPLIT_LED= 20
WD_LED= 12, 20
EX_ILLUM_LED=250,250
EX_FIX_LED= 50, 50
INT_FIX_LED= 10

	Characteristic value	Fixed name	Description	Initial value*	Tab on tool software
a	00000006	Serial No.	Serial number	00000000	Initialize
b	CR-2	Model Name	Model name	CR-2	
c	20100430	YYYYMMDD	Date saved	00000000	
d	517	Focus_pos	Focus lens 0D position	518	Adjustment All Data
e	522	Split_pos	Near-infrared split reference position	521	
f	18	Std	Near-infrared observation standard light intensity	15	
g	0	–	–	0	
h	-1	Col	COL capture light intensity correction value	0	
i	0	–	–	0	
j	12	WD1	Right and left "WD LED" brightness setting value	24	
k	20	WD2		24	
l	20	Split	"Split LED" brightness setting value	20	
m	-2	Color_B	Color correction	0	
n	-9	Color_M		0	
o	286	UP Gain	Unit up/down movement correction value	0	
p	419	UP Offset		0	
q	281	DOWN Gain		0	
r	124	DOWN Offset		0	

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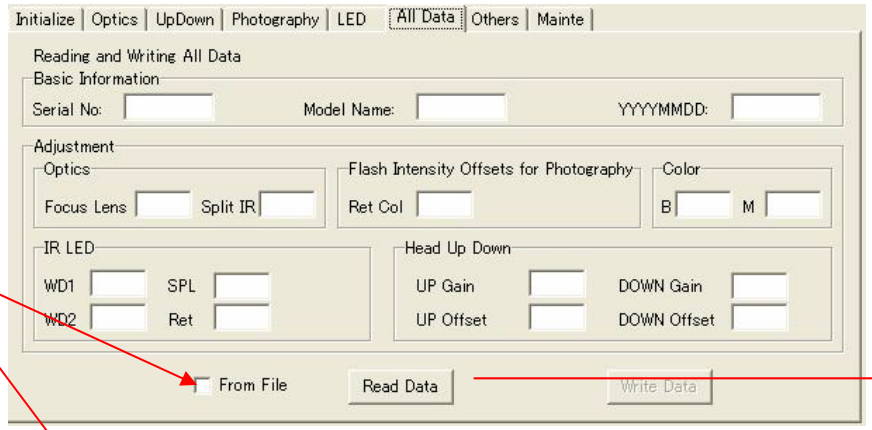
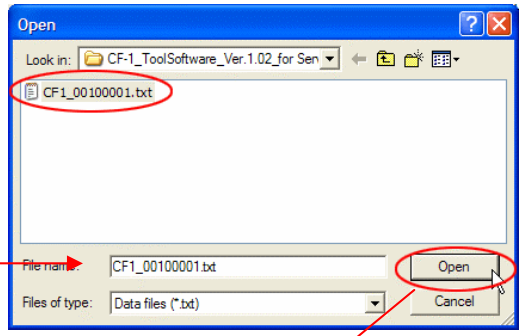
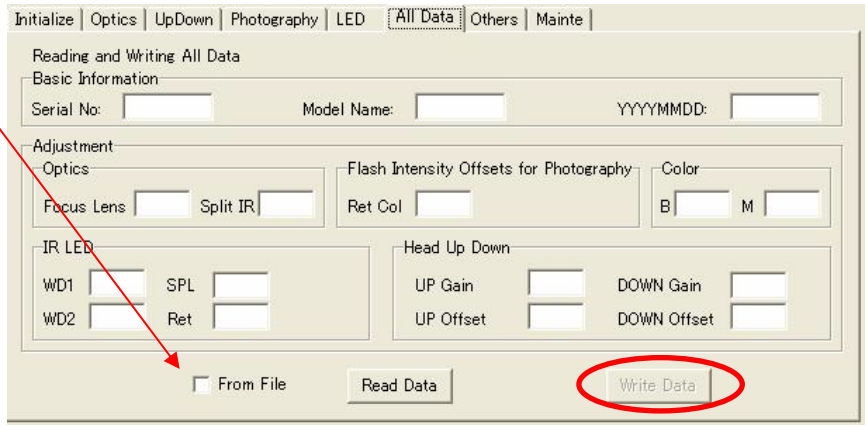
Tool Software – All Data Screen (Write)

Check 'From File' box.







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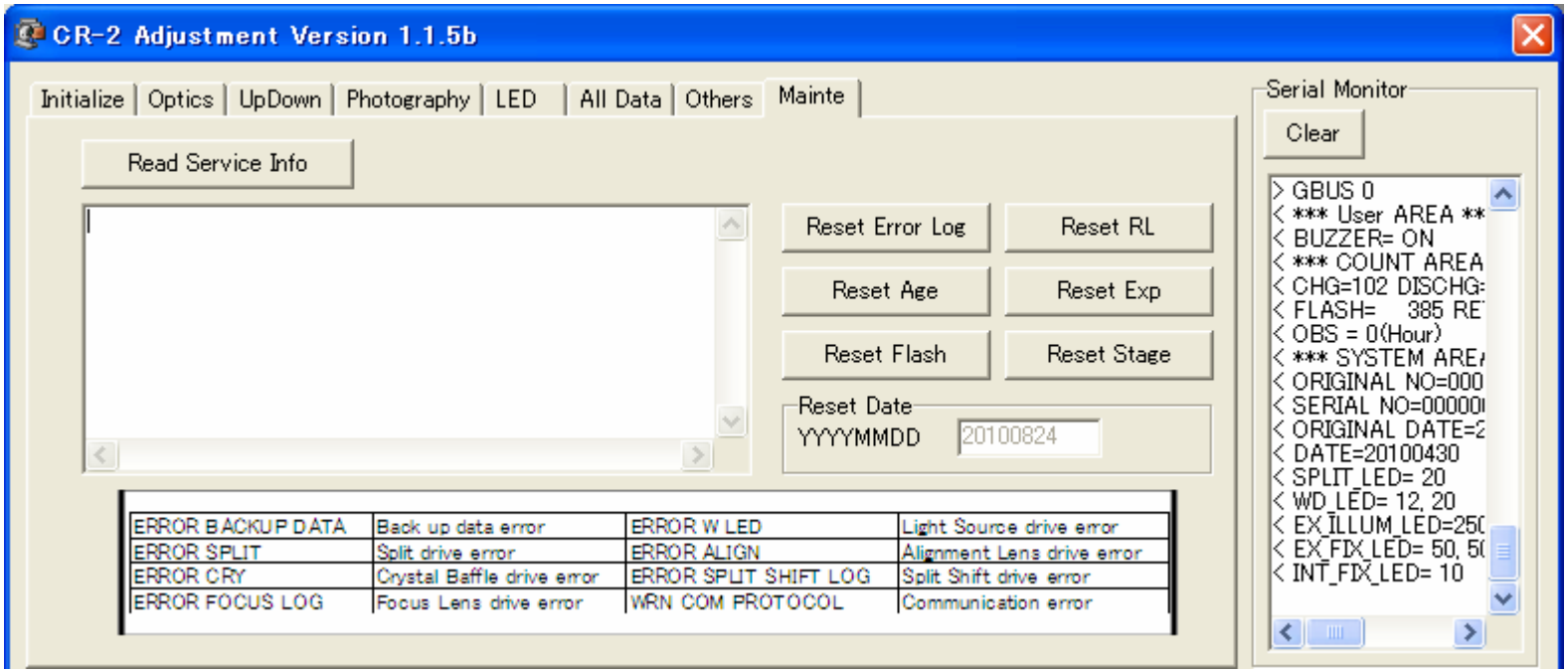
Tool Software – Maintenance

In the Mainte tab, the CR-2 power-on time, operating status, error logs, and other service information required for maintenance and inspection can be read, viewed, and reset.

1: Read Service Info - to read the service information from the connected CR-1 main unit and store in the SerialLog.txt file.
2: Reset Error Log - to clear the recorded log of the errors (up to 100).
3: Reset Age - to reset the recorded power-on time (in days: minutes format) to zero.
4: Reset Flash - to reset the number of times recorded for the firing of the xenon tubeto zero.
5: Reset RL - to reset the number of R/L switch ON/OFF times recorded to zero.
6: Reset Exp - to reset the number of times recorded for the pressing of the shutter release button to zero.
7: Reset Stage - to reset the number of times recorded for the pressing of the flash intensity switch (UP side) to zero.
8: YYYYMMDD - Replacement date which is recorded when item 9 is performed.
9: Reset Date - to update the replacement date of the xenon tube.



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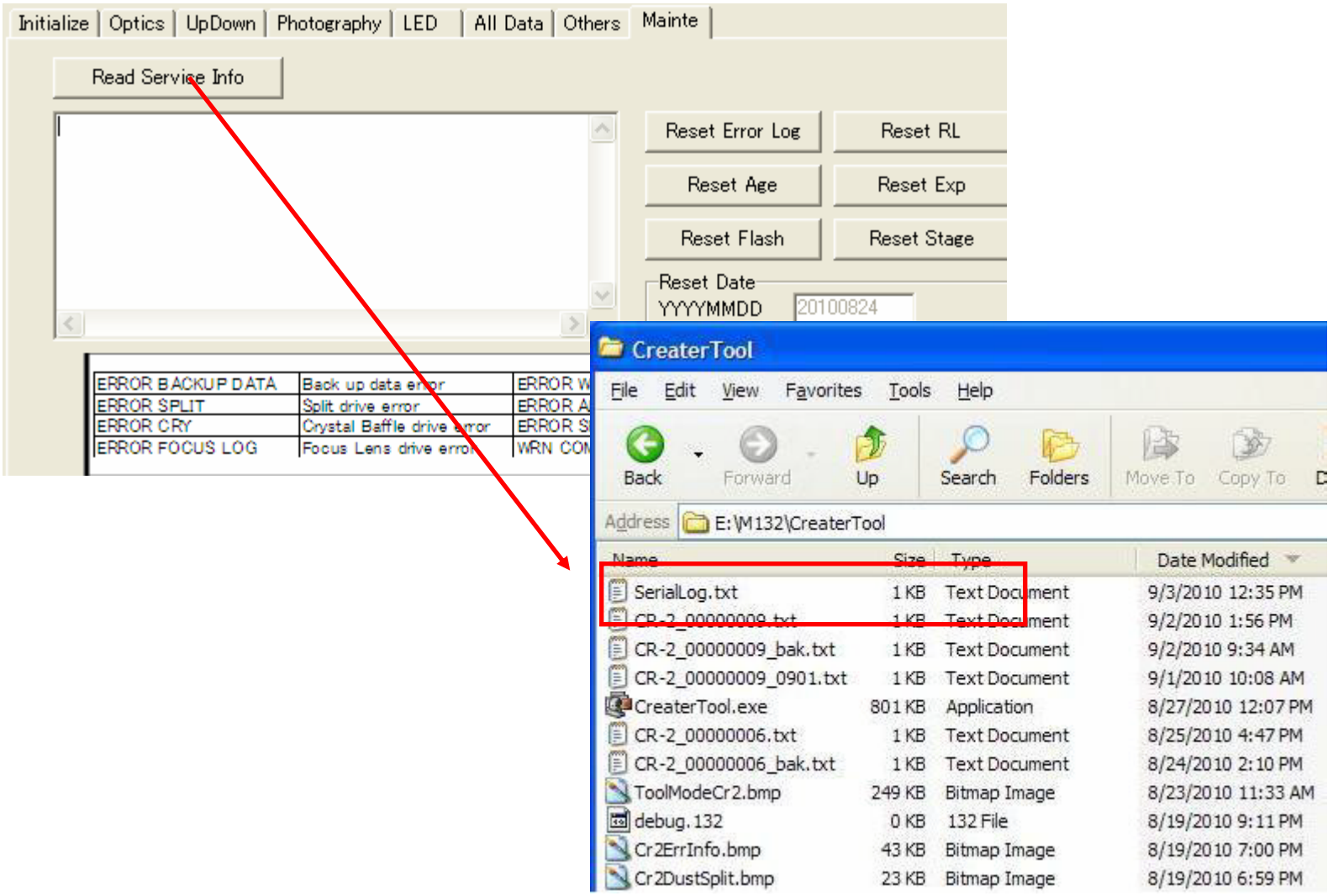
Tool Software – Maintenance



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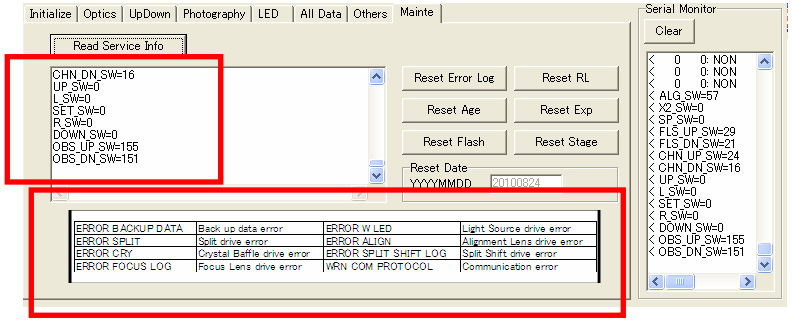
Tool Software – Maintenance

Display item	Service information	Explanation of Command in SerialLog.txt file
Flash Count Info* 387	Number of light emissions of capture light "white LED" after [Reset Flash] button was pressed	>GFCT 0
AGE Info (Day Min)* 2: 107, 0(OBS HOUR)	Power-on time (days: minutes) after [Reset Age] button was pressed	>GAGE 0
Flash Lamp Date Info* 20100430	Date (YYYYMMDD) that capture light "white LED" was installed at production	>GFMD 0
Obs Lamp Date Info* 20100430	Date (YYYYMMDD) that observation light "IRED LED" was installed at production	>GOMD 0
SW Count Info* RL = 100 EXP = 218 Stage = 329	RL=: Stage R/L switch ON/OFF count after [Reset RL] button was pressed EXP=: Number of times capture switch was pressed after [Reset Exp] button was pressed Stage=: Number of times capture light intensity adjustment switches (UP side) were pressed after [Reset Stage] button was pressed	>GCRL 0 >GCEX 0 >GCST 0
ERROR LOG AREA 0 0: NON 0 0: NON 0 0: NON 0 0: NON | | | | 0 0: NON 0 0: NON	Error information (100 events) that occurred in the CR-2 unit after [Reset Error Log] button was pressed	>GERL 0



ALG_SW=59 X2_SW=0 SP_SW=0 FLS_UP_SW=29 FLS_DN_SW=21 CHN_UP_SW=24 CHN_DN_SW=16 UP_SW=0 L_SW=0 SET_SW=0 R_SW=0 DOWN_SW=0 OBS_UP_SW=155 OBS_DN_SW=151	The SW Count not including the SW Count Info is displayed at the bottom of the error information (100 events). ***Explanations*** ALG-> Alignment switch X2-> [×2] capture button SP-> Small-pupil capture button FLS-> Capture light intensity adjustment button CHN-> Chinrest button UP, L, R, DOWN-> Cross buttons for Fix Target SET-> Set button OBS-> Observation light intensity adjustment button *In the FLS/OBS, UP is [+] and DOWN is [-].	>GERL 0

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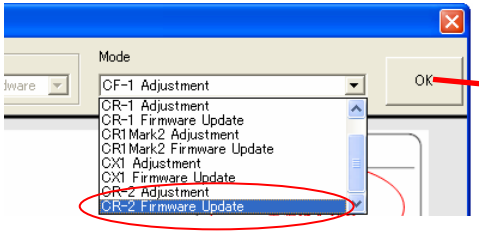
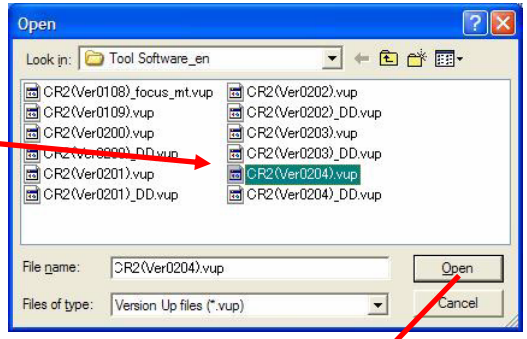
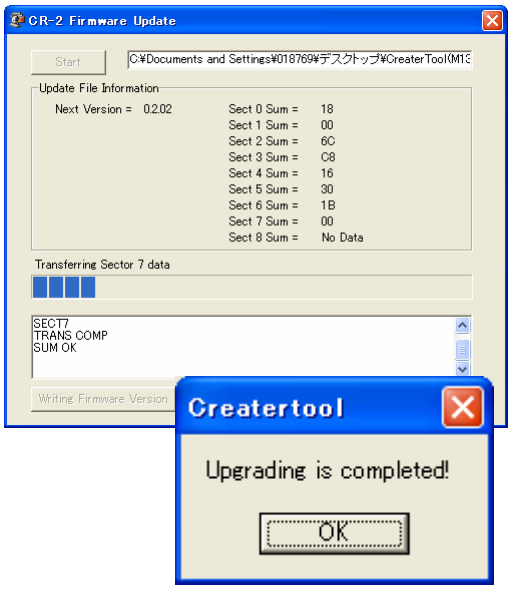
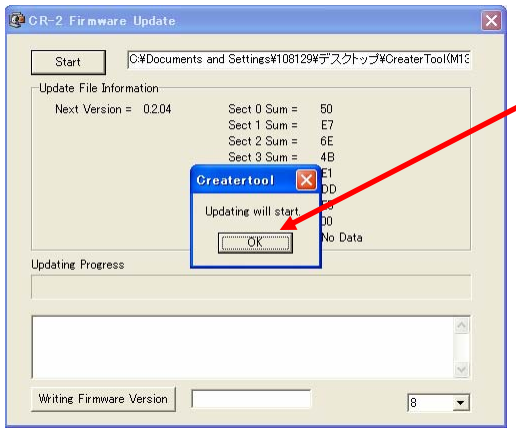
Tool Software – Firmware Upgrade

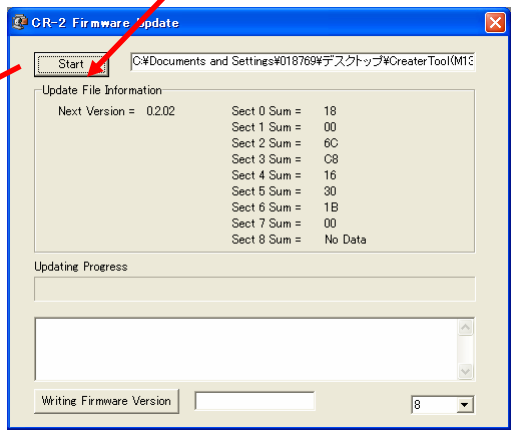




The filename of the version update file is defined as follows:
Update filename : CR-2 XXXX.vup
(CR-2; Version, in 4 digits.vup)







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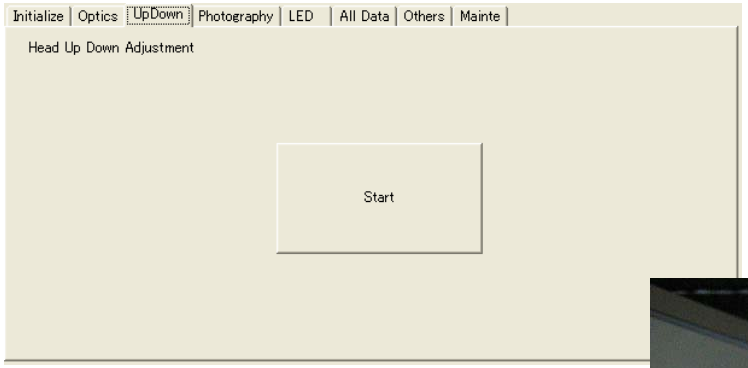
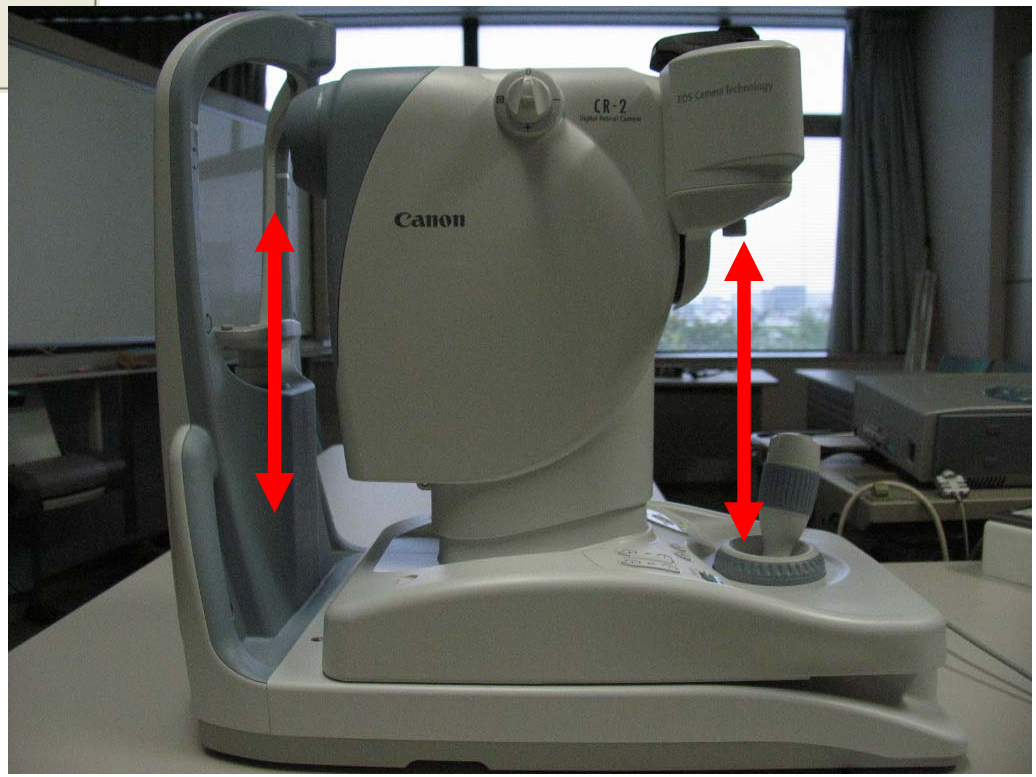
Tool Software – Up/Down Movement Adjustment



NOTE1: Adjustment is performed automatically after the [Start] button is pressed.
(The speed is changed, and the unit performs three up-and-down cycles.)

NOTE2: The adjustment cannot be performed properly if anything touches the main unit during the adjustment process, and so be careful not to touch the main unit.

NOTE3: Operation from the operation panel (including joystick) is disabled during and after the adjustment process.



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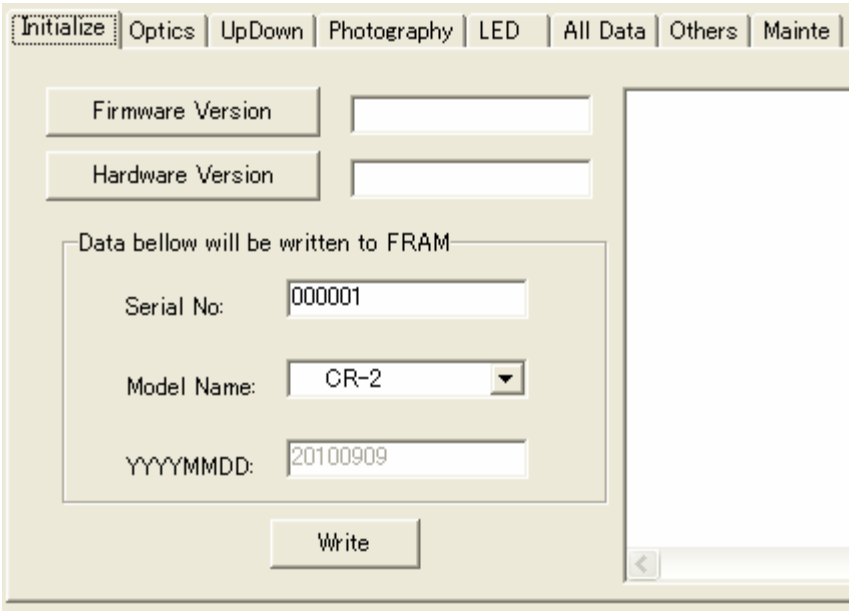
Tool Software – Initialise Screen

This function enables the product information to be displayed and set.



[1]: Firmware Version

The firmware version of the CR-2 retinal camera (main board) can be captured and checked by pressing the [Firmware Version] button.

[2]: Hardware Version

The hardware version of the CR-2 retinal camera can be captured and checked by pressing the [Hardware Version] button.

[3]: Serial No.

The system number can be set and input here. (“000001” appearing at startup is the default number.)

The system number which can be input is a fixed 6-digit number, and the input of a number other than one containing 6 digits will not be accepted.

(Example: 100001)

[4]: Model Name

The model name setting can be selected here.

[5]: YYYYMMDD

The date (year/month/day) of recording is displayed here. (This cannot be changed since it is synchronized with the PC date (year/month/day).)

[6]: By pressing the [Write] button, the settings of [3] and [4] can be written into the FRAM on the main board of the CR-2 retinal camera.

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Others Technical Info – Error and Warning Processes

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The error and warning processes are executed based on the rules below.

1) When an error or warning is detected, the status is recorded in an error log.

2) After an error or warning has occurred, any series of operations that is required is performed.

3) After the required series of operations is completed, the error or warning is displayed.

4) The error or warning process is performed separately for each event based on the order that it was recorded in the “Error/Warning List.”

5) Any errors that occurred before connection communication with the Rics NM2 (when the CR-2 power is turned on) are not displayed on the Rics.

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Others Technical Info – Error and Warning Processes

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Whenever a warning is recorded, a buzzer sound (beeping interval: 0.2 seconds (0.2 seconds) ×3, identical to CF-1) is output. If an error status is recorded, the system changes to the SYS_ERROR status, and a buzzer sound (quick beeping: 0.1 seconds (0.1 seconds) ×5, identical to CR-1) is output.

Table 1: Error/Warning List

Level	Notification no.	Error name	Conditions for occurrence	Conditions for clearing	Display	Remedy
Error	003	Backup data error	Backup data error (INI mode only)	Power off	(1) The notification number is sent to the control software. (2) The error/warning information is displayed in the control software. (3) This is displayed in SYS_ERROR mode.	Change to SYSTEM ERROR MODE
	010	Split drive failure	Not at designated position when stopped			
	011	Light shield1 drive failure	Not at designated position when stopped			
	015	Focus drive failure	Current position is outside the range. The difference (AD value 10) from the target position is not within 1 second.			
	016	Light source switching drive failure	Not at designated position when stopped			
	017	External eye lens drive failure	Not at designated position when stopped			
	018	Split shift drive failure	Current position is outside the range. The difference (AD value 10) from the target position is not within 1 second.			
Warning	108	External communication error	Timeout NAK OVER		(1) The notification number is sent to the control software. (2) The error/warning information is displayed in the control software.	Initialize communicati on-related variables
	207	Diopter correction knob position error	Capture switch was pressed while at improper position			
	208	Diopter correction IN during external eye observation	Diopter correction IN at external eye observation when connected to Rics			

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Others Technical Info – Error and Warning Processes

Table 2: LED Status on CR-2 Unit During Errors and Warnings

Level	Notification no.	Error name	Panel LED					
			Observation light intensity + indicator	Observation light intensity - indicator	Capture light intensity + indicator	Capture light intensity - indicator	SP indicator	×2 indicator
Error	003	Backup data error	Flashing green	Flashing green	Off	Off	Off	Off
	010	Split drive failure	Flashing green	Flashing green	Flashing green	Flashing green	Off	Off
	011	Light shield1 drive failure	Flashing green	Flashing green	Flashing green	Flashing green	Flashing green	Off
	015	Focus drive failure	Off	Flashing green	Flashing green	Flashing green	Flashing green	Flashing green
	016	Light source switching drive failure	Off	Off	Flashing green	Flashing green	Flashing green	Flashing green
	017	External eye lens drive failure	Off	Off	Off	Flashing green	Flashing green	Flashing green
	018	Split shift drive failure	Off	Off	Off	Off	Off	Flashing green
Warning	108	External communication error	Flashing green	Lit green	Lit green	Lit green	Undetermined (–)	–
	207	Diopter correction knob position error	Flashing green	Flashing green	Lit green	Lit green	–	–
	208	Diopter correction IN during external eye observation	Lit green	Lit green	Flashing green	Flashing green	–	–

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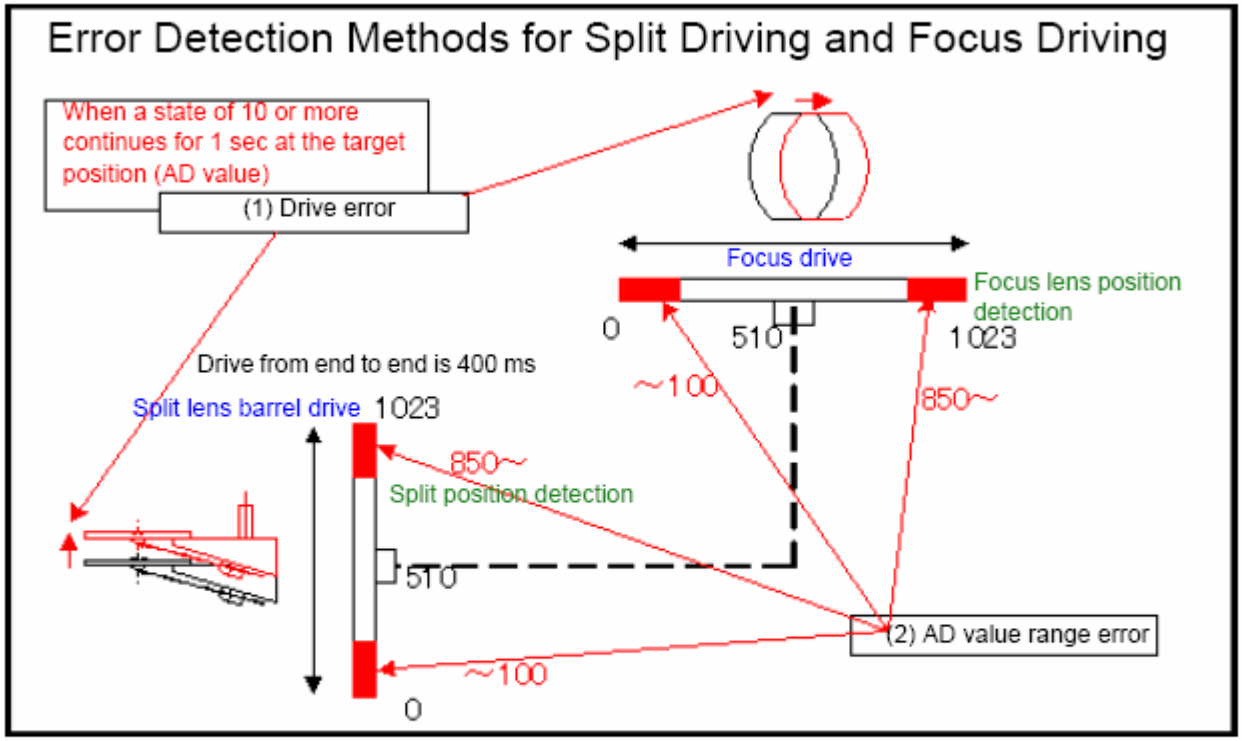
Others Technical Info – Error and Warning Processes

Table 3: Error Detection Methods for Split Driving and Focus Driving



NOTE: Operation when backup data is corrupted

If an error is found in the light check for the backup element (FRAM), this is designated as a backup data error (Tables 1 and 2). If there is no problem hindering operation, the backup data is read, and if the read data is outside the range, the system is reset to the initial values and restarted.

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Others Technical Info – Error and Warning Processes

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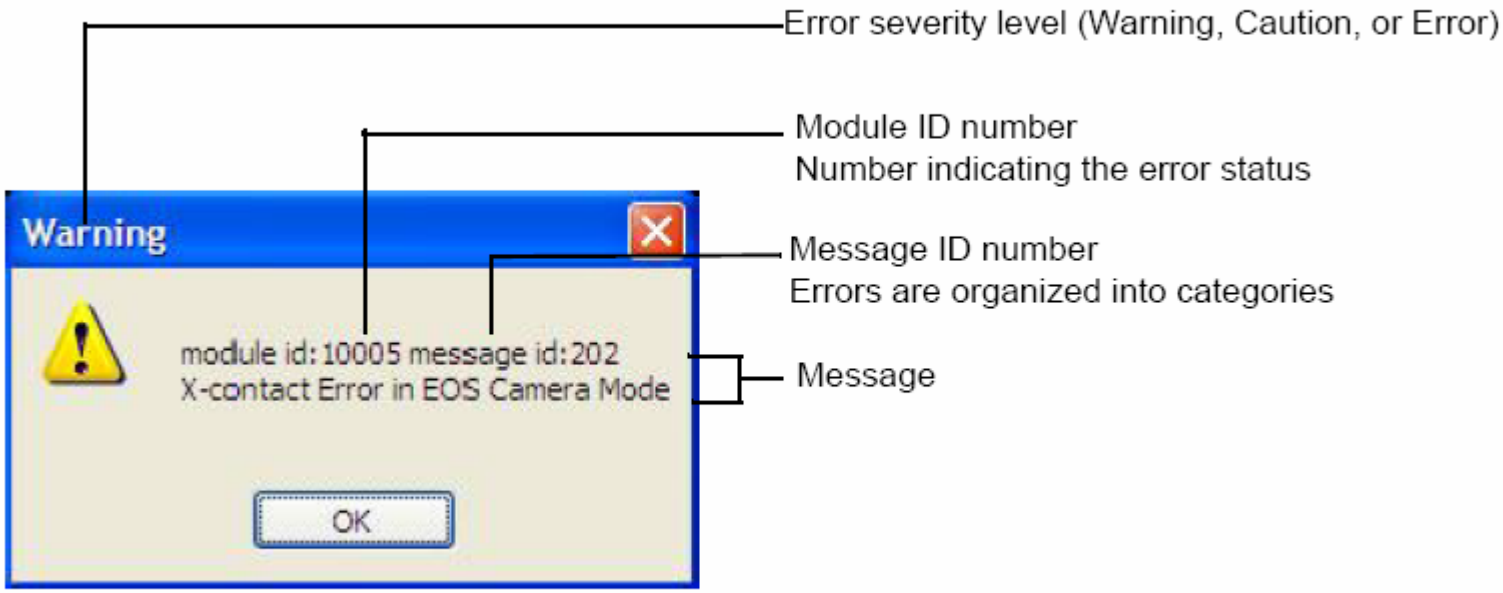
Example of Error Window



For details about error messages, see the instruction manual and attached documentation.

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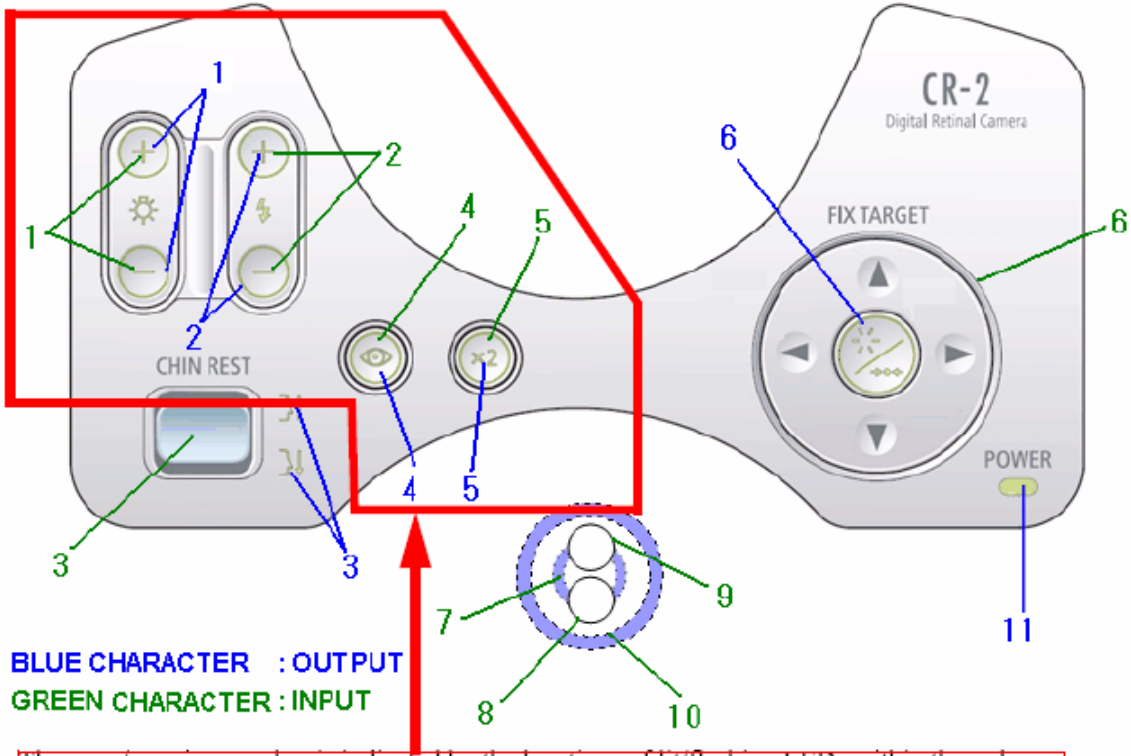
Others Technical Info – I/O Test



The error/warning number is indicated by the locations of lit/flashing LEDs within the red area.
*Errors are easy to confirm because flashing of the LEDs is repeated. Warnings, however, are indicated by flashing of the LEDs during the buzzer sound (beeping) only.

1.Observation light intensity ± indicators
2.Capture light intensity ± indicators
3.Chinrest up/down indicators
4.SP indicator
5.x2 indicator
6.Internal fixation indicator
11.Power indicator

1.Observation light intensity ± switches
2.Capture light intensity ± switches
3.Chinrest up/down switch
4.SP switch
5.×2 switch
6.Internal fixation lamp operation switch
7.Up/down movement knob

8.Capture switch
9.Alignment switch
10.Focus knob

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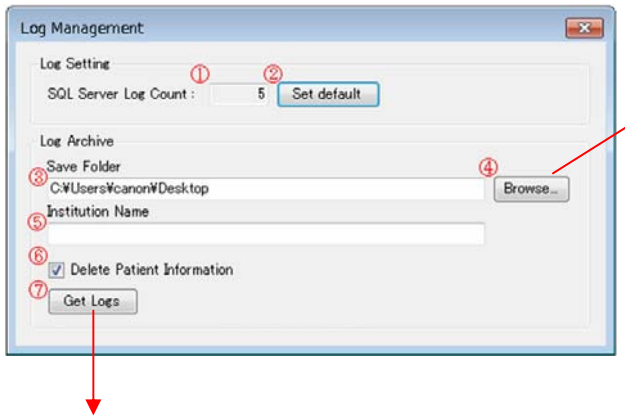
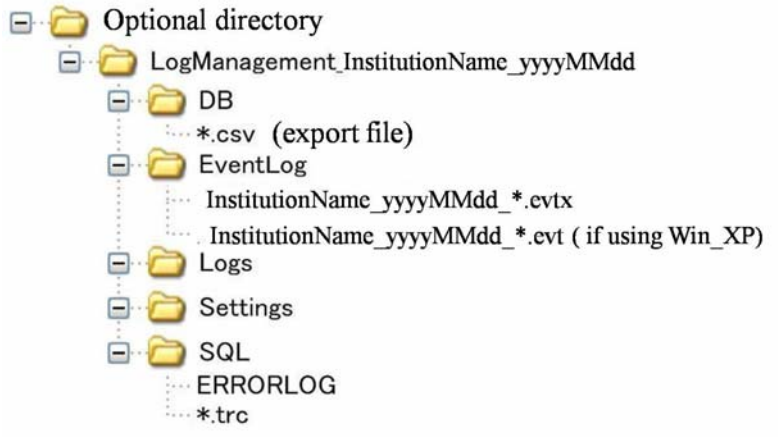
Others Technical Info – Error Log

The LogManagement tool is used for collecting setting file, log file, database table, SQL server log file and Windows event log file pertinent to the RICS. In the event of unusual failure, collect and submit these information for analysis and remedy.

File name	Description
LogManagement.exe	Tool program file
LogManagement.log	Log file (Automatically created when tool is executed)





Log storage directory is created to where it was pathed.

- A folder with the "Logmanagement_InstitutionName_Date" name format is created as the log storage directory under the storage directory path that was entered at the main screen, and the various log types are copied under this folder. The date format is "yyyyMMdd".
- The institution name and date are added to the EventLog file name only to facilitate log analysis.
- If the institution name and date are already found in the same folder when acquiring the logs, overwriting of the files is confirmed.

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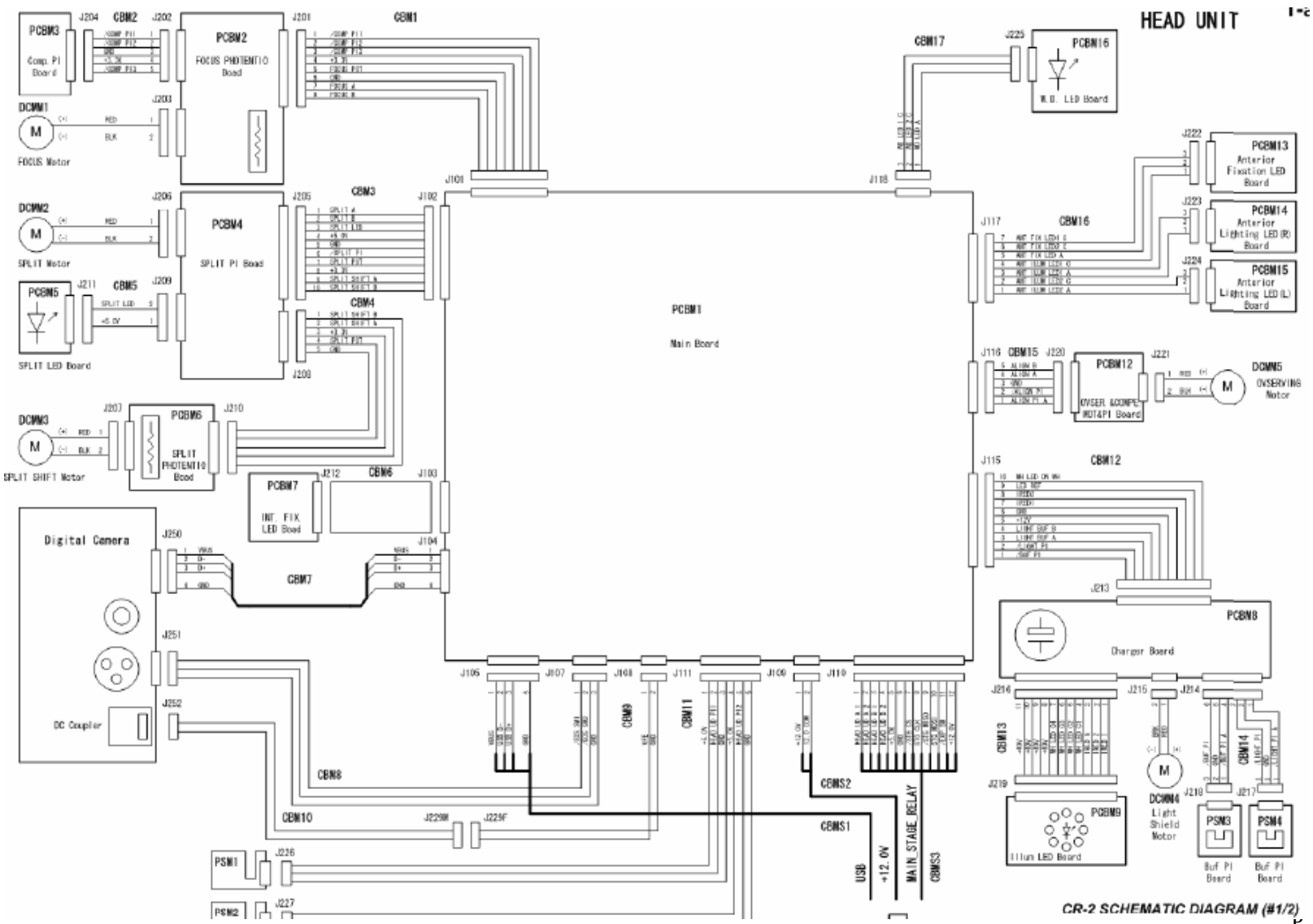
Electrical Schematic



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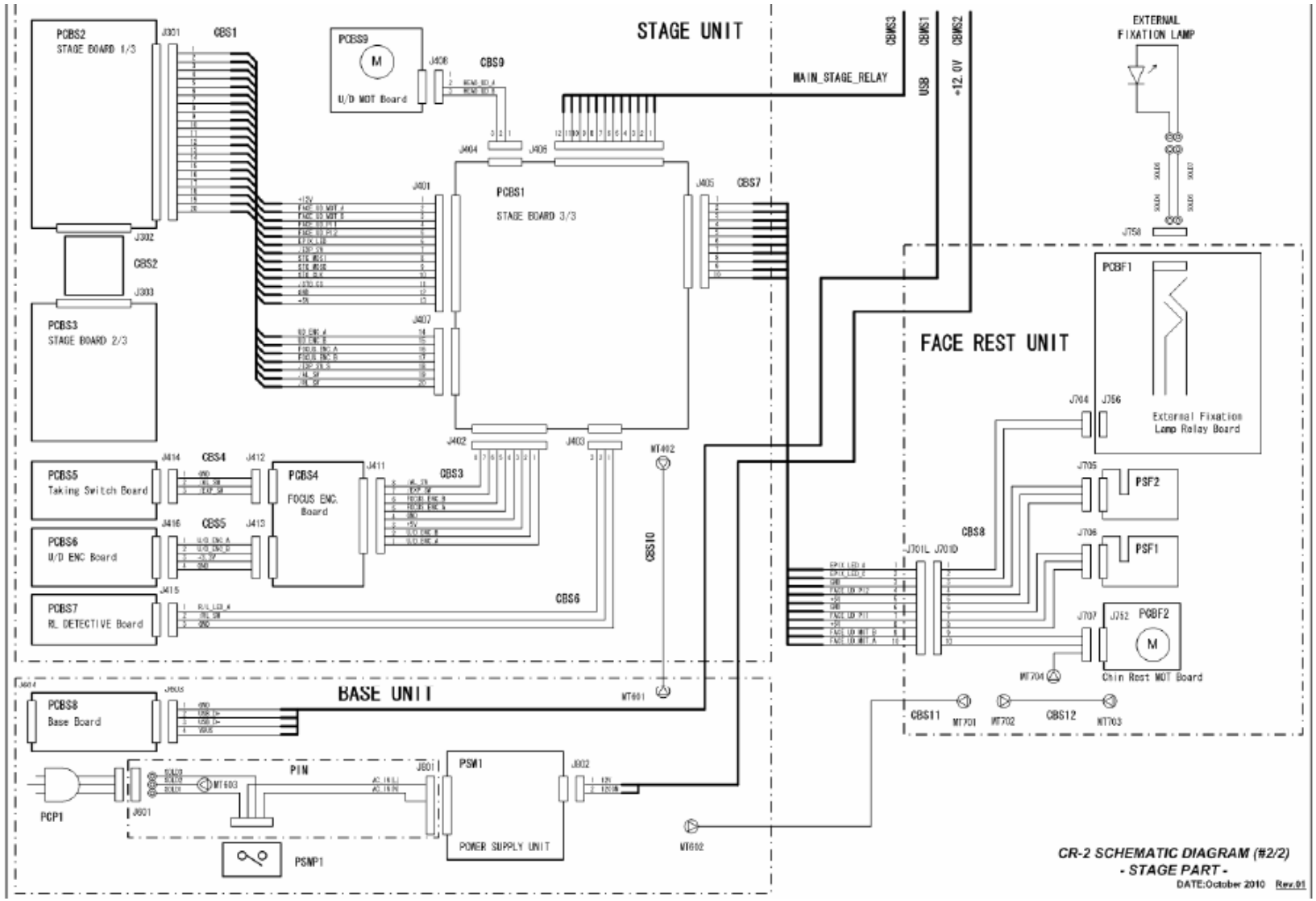
Electrical Schematic



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Introduction – New Functions

- AE (Auto Exposure) function
- Setting for return to external eye observation after capture (yes/no)
- Added position reset for internal fixation lamp
- Separate saving and transfer of RGB, RedFree, and Cobalt images (Digital color filter)
- Screen capture function
- Function that imports the study log file data for re-editing and transferring the data
- Overlay of patient name on JPEG, TIFF, and DICOM images
- Study Log screen can be set to remain open after transfer is completed
- Direct editing of folder path in Storage Folder settings
- Change to display of study dates in Compare Study screen

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Introduction – New Functions

- Change to number of acquired worklists
- Change to SC modality
- Saving in JPEG or Lossless format
- Study delete log
- Study import log
- Log Management tool
- Function for changing the number of saved logs in SQL server from 6 to 30
- Function that uses the mouse wheel to enlarge or reduce the image centered on the mouse position (pointer)
- Support for installation on Windows 7
- Modify UI of C/D screen

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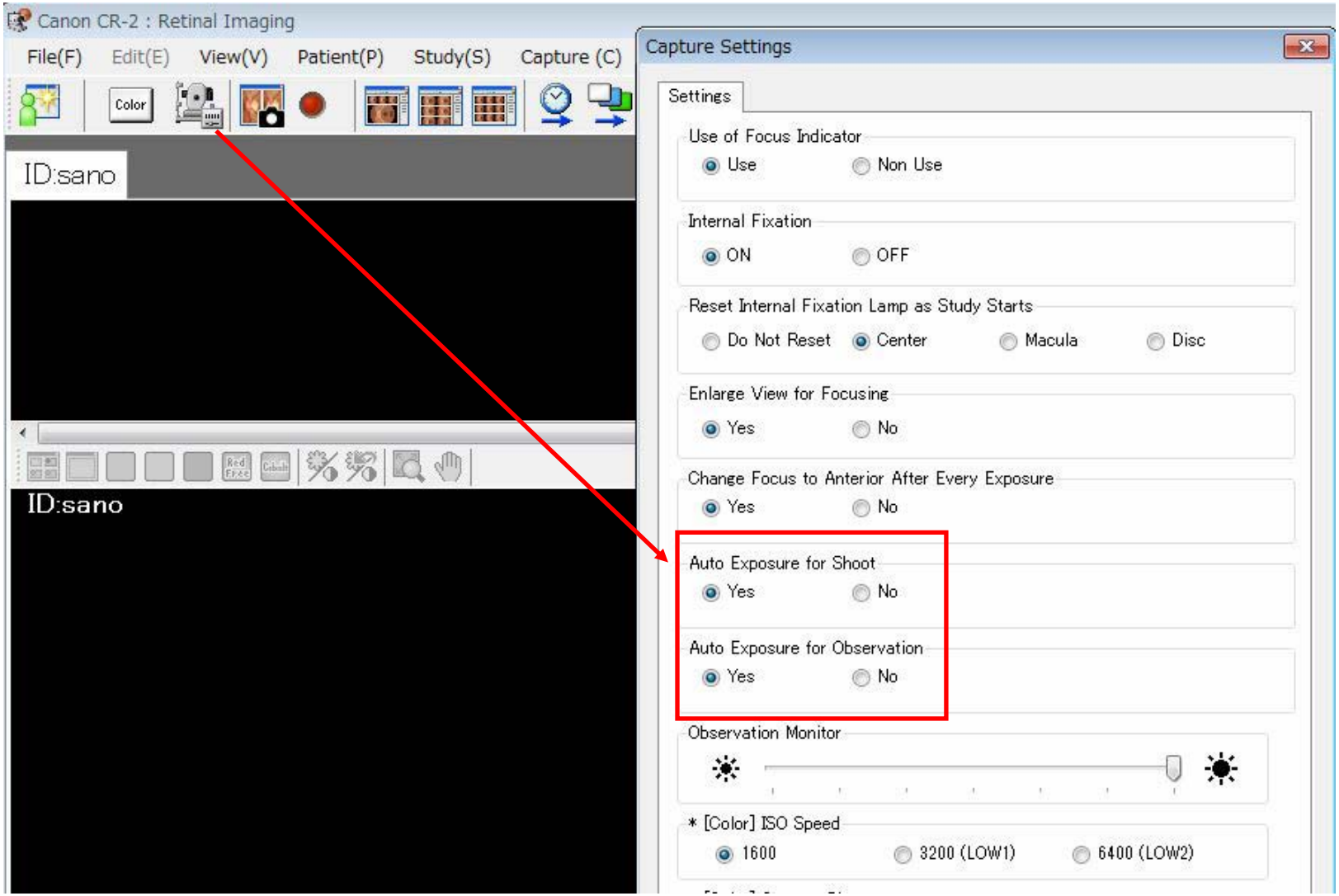
Auto Exposure (AE) Function



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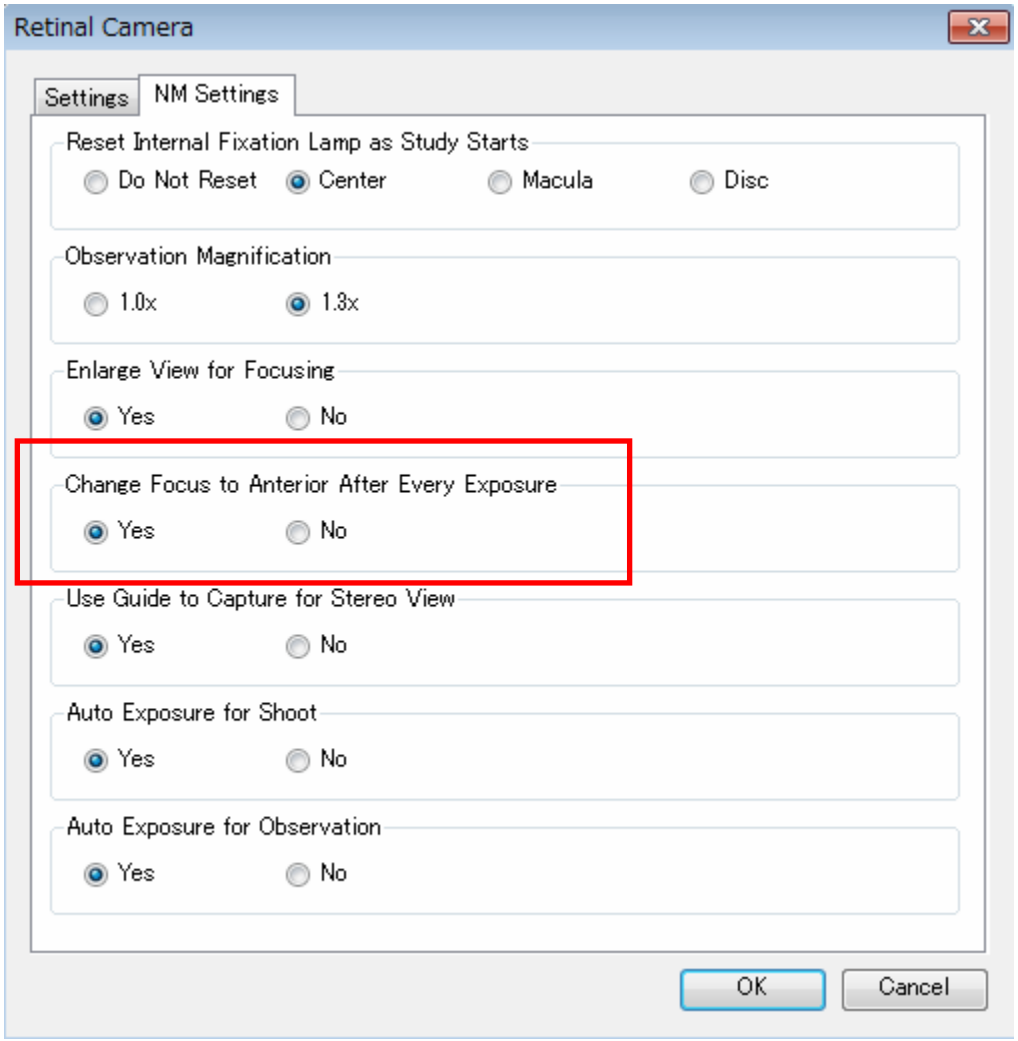
Setting for Return to External Eye Observation After Capture



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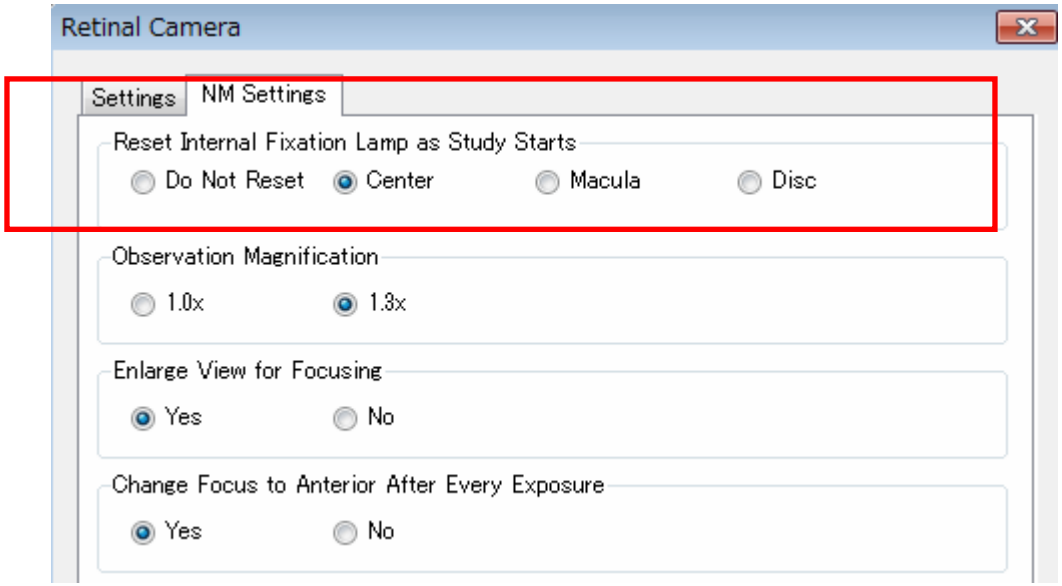
Added Position Reset for Internal Fixation Lamp



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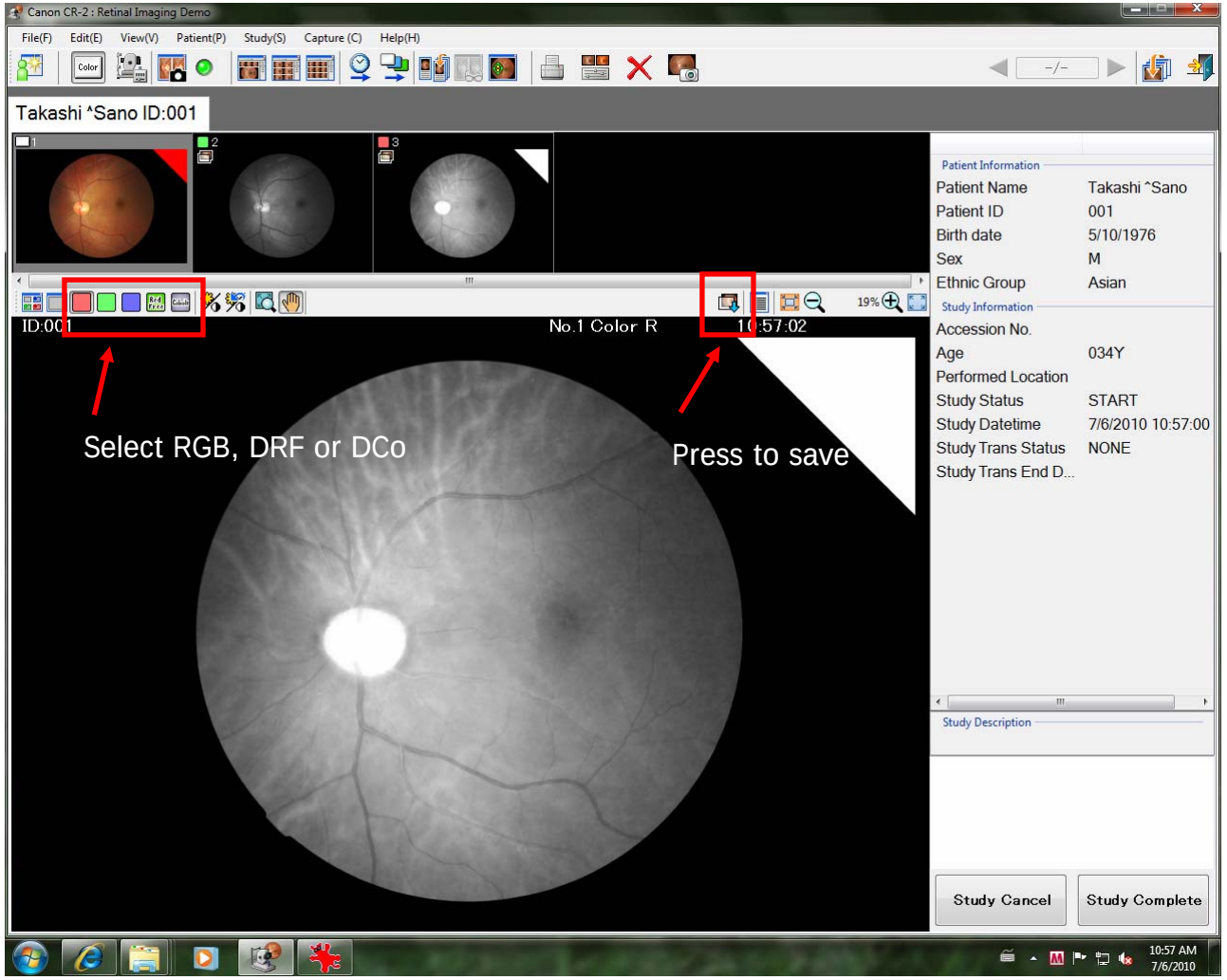
Separate Saving and Transfer of RGB, Digital RF and DigitalCobalt Images



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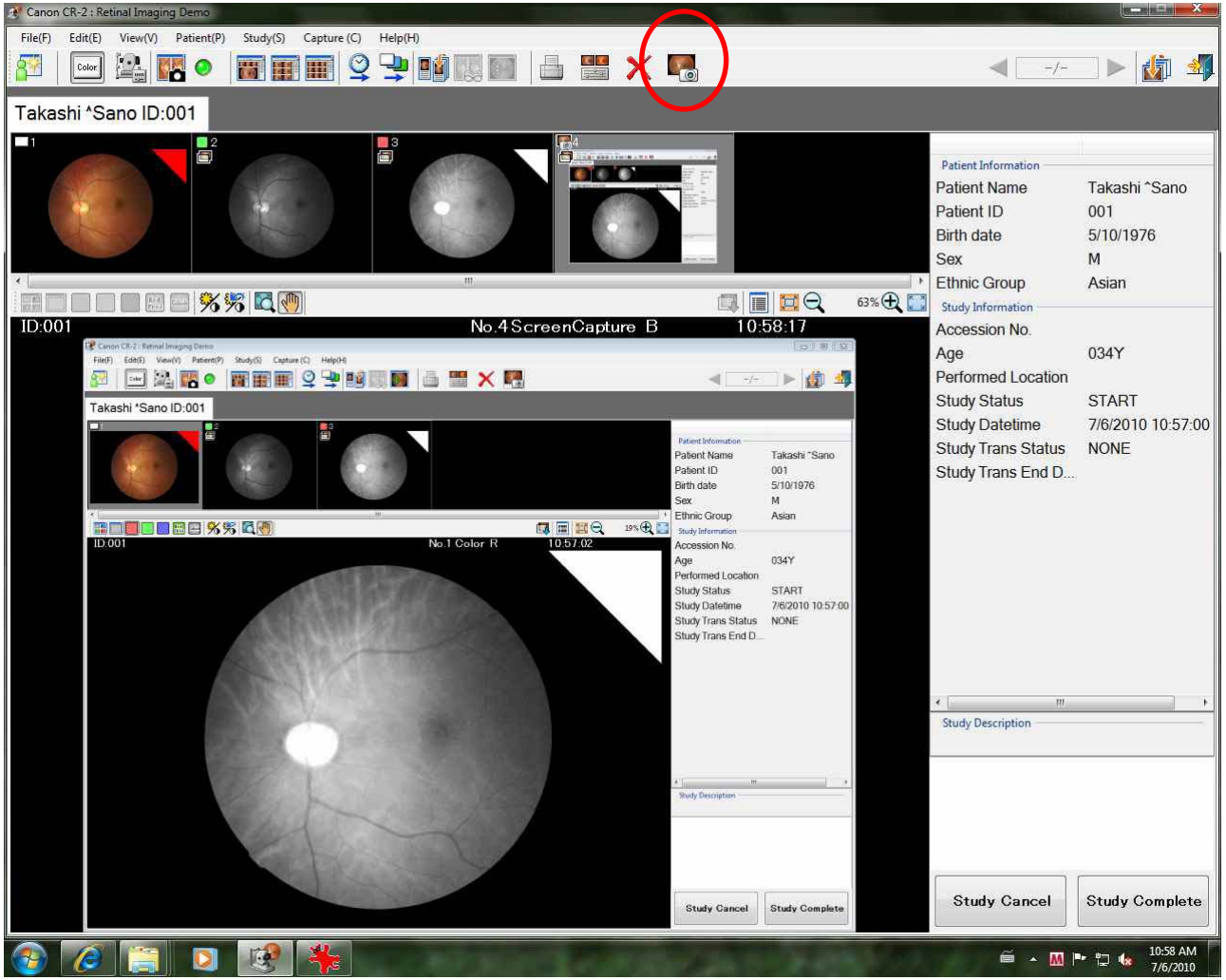
Screen Capture Function



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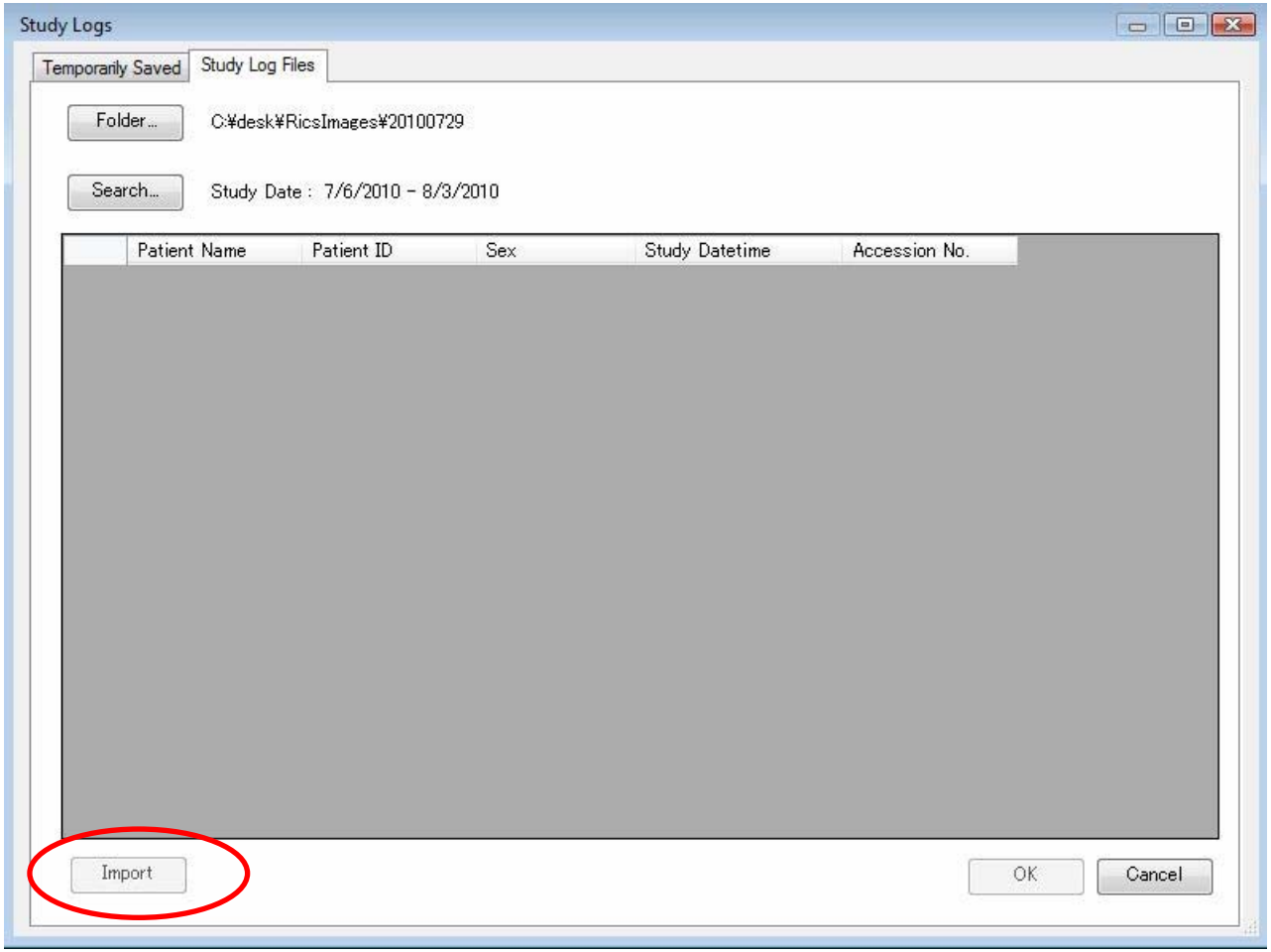
Function to Import Study Log File Data for Re-editing and Transferring the Data



NOTE: A maximum number of 100 studies can be imported.
NOTE: This software enables importing and browsing only for external studies that were output by an NM (retinal) type imaging cameras (such as the CR-1 or CR-1 Mark II).

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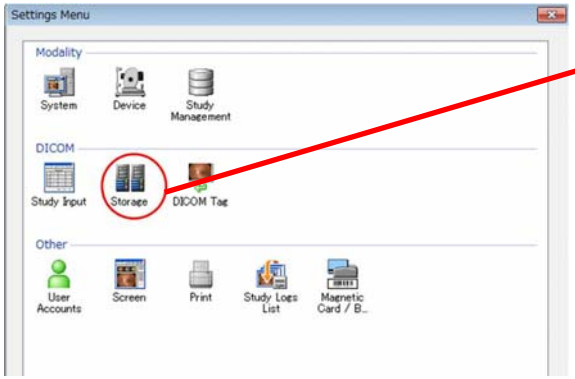
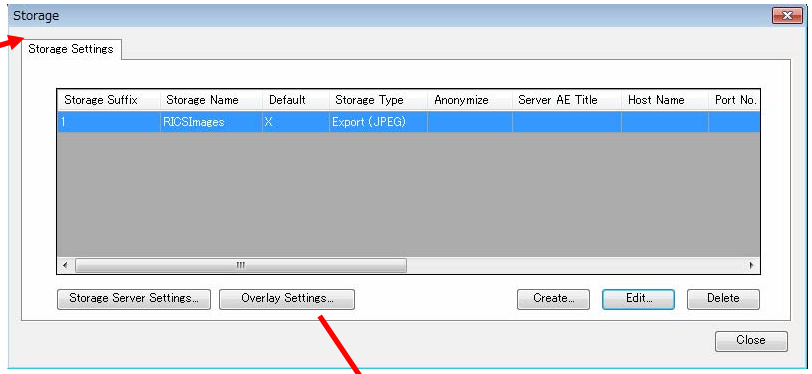
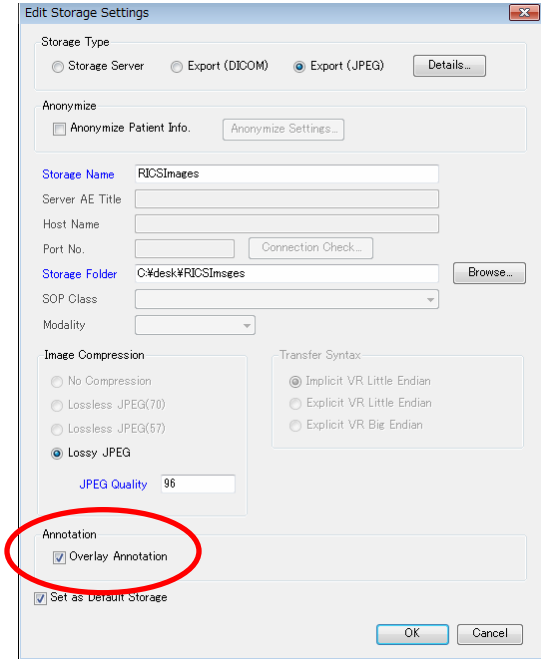
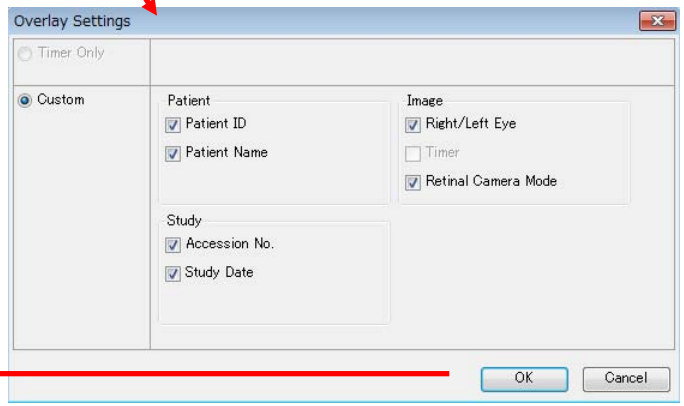
Overlay of Patient Name on JPEG, TIFF, and DICOM Images









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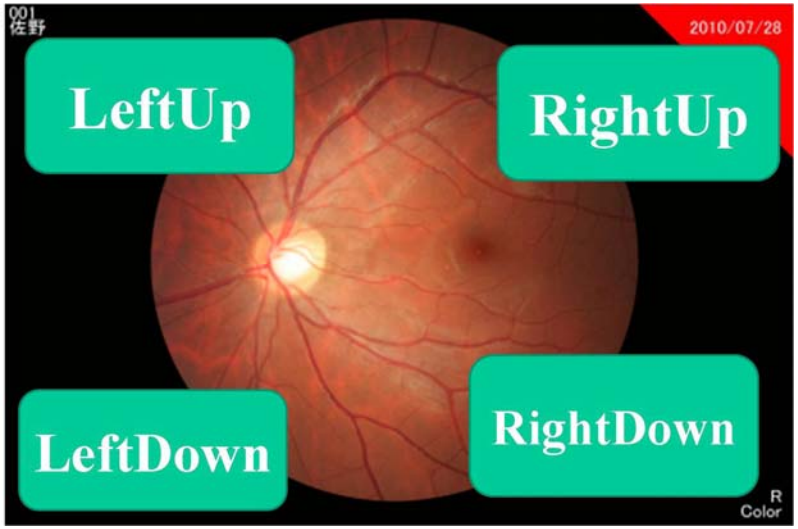
Overlay of Patient Name on JPEG, TIFF, and DICOM Images



Edit ini file,
ProgramFiles\Canon\RicsNM2\Settings\TransOverlayInfo.ini
to customise annotation.

String:
<Item>=<Group>.<Row>.<FontSizeType>.<FontSize>

Example: PatientID=LeftUp.0.Relative.400

PatientID will appear on,

Upper left corner,
Row 0,
Relative font,
Font size is 4% of Image.

NOTE: backup before editing.

```
reMode↓
[TransPatientNameItem]↓
FamilyNameDraw=true↓
GivenNameDraw=true↓
MiddleNameDraw=false↓
PrefixDraw=false↓
SuffixDraw=false↓
[TransOverlayGroup]↓
LeftUp=100.100.5900.0.true.true↓
RightUp=9900.100.3900.0.false.true↓
LeftDown=100.9900.5900.0.true.false↓
RightDown=9900.9900.3900.0.false.false↓
[TransOverlaySetting]↓
AccessionNumber=RightUp.0.Relative.400↓
CaptureMode=RightDown.0.Relative.400↓
LeftRight=RightDown.2.Relative.400↓
PatientId=LeftUp.0.Relative.400↓
PatientName=LeftUp.1.Relative.400↓
StudyDate=RightUp.1.Relative.400↓
Timer=RightDown.1.Relative.400↓
[EOF]
```

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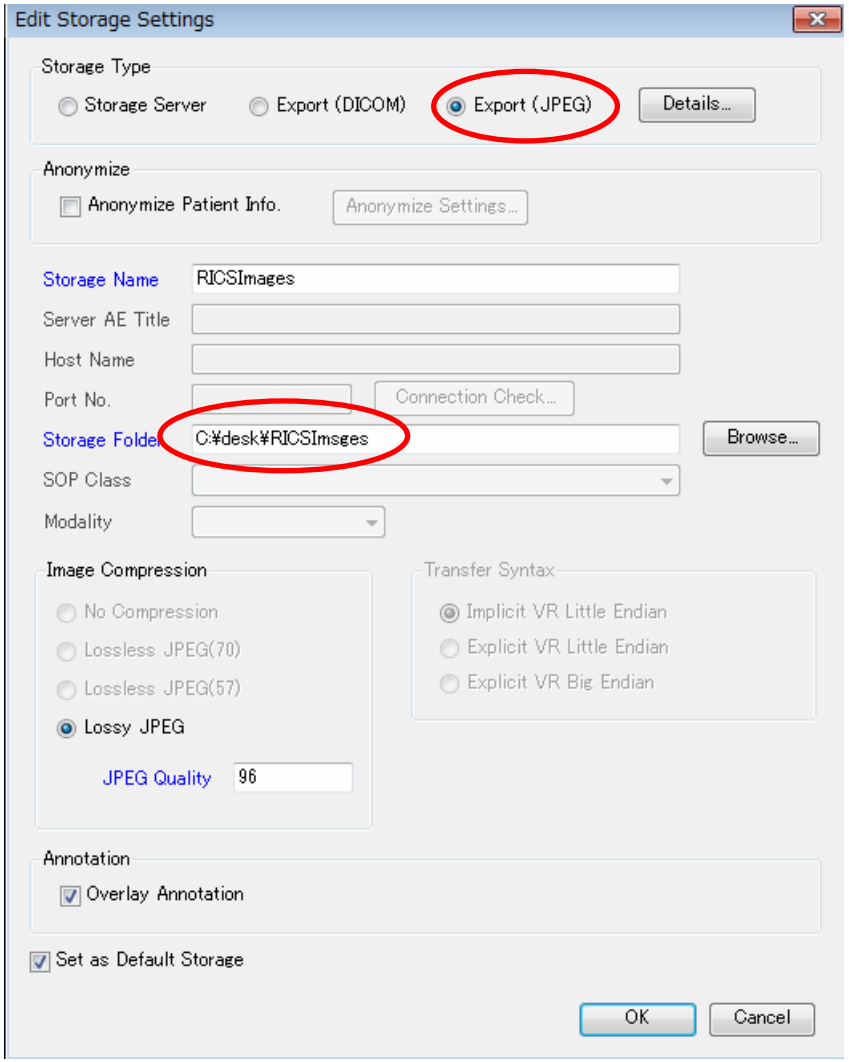
Direct Editing of Folder Path in Storage Folder Settings



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Display of Study Dates in Compare Studies Screen

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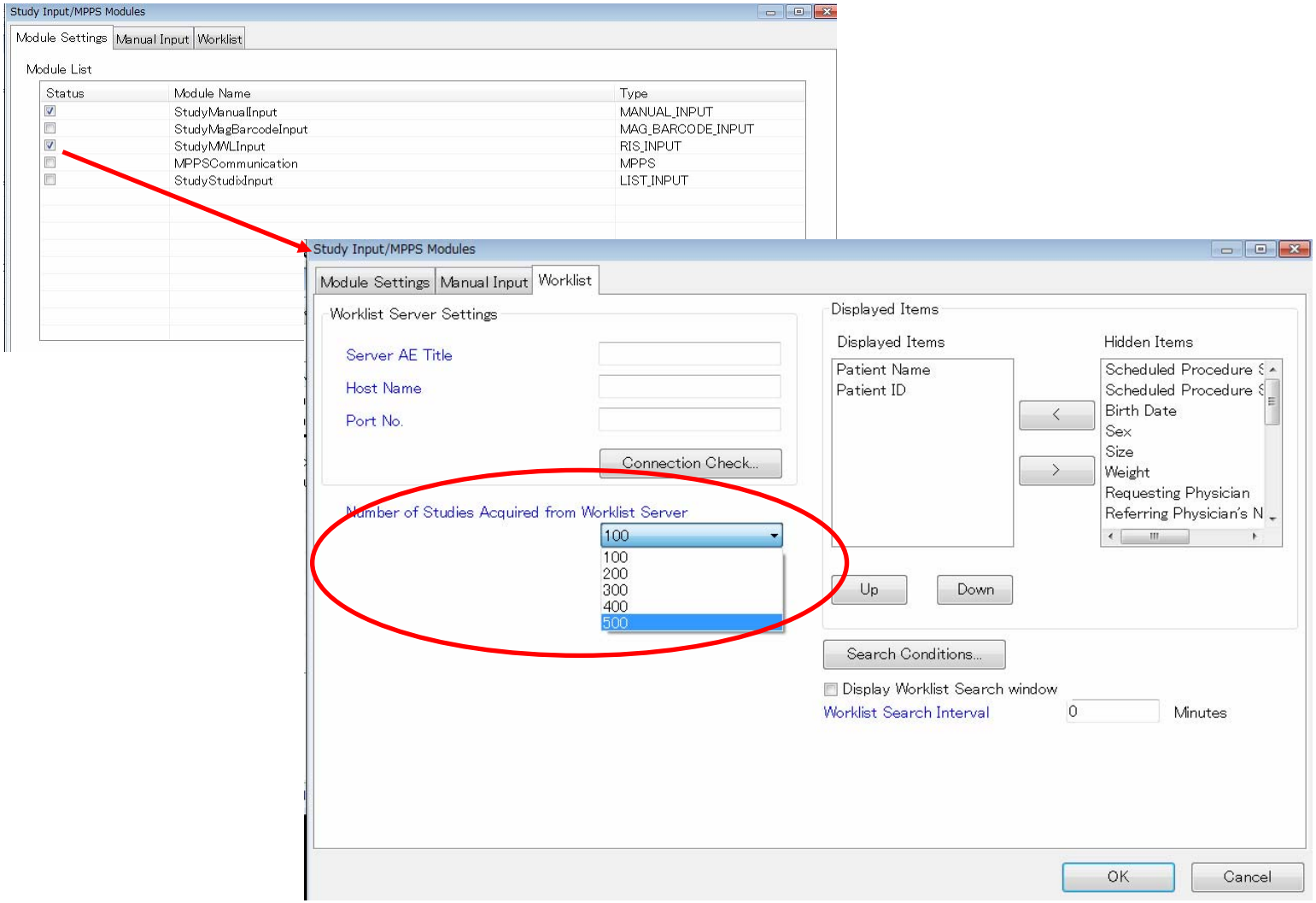
Change to Number of Acquired Worklists



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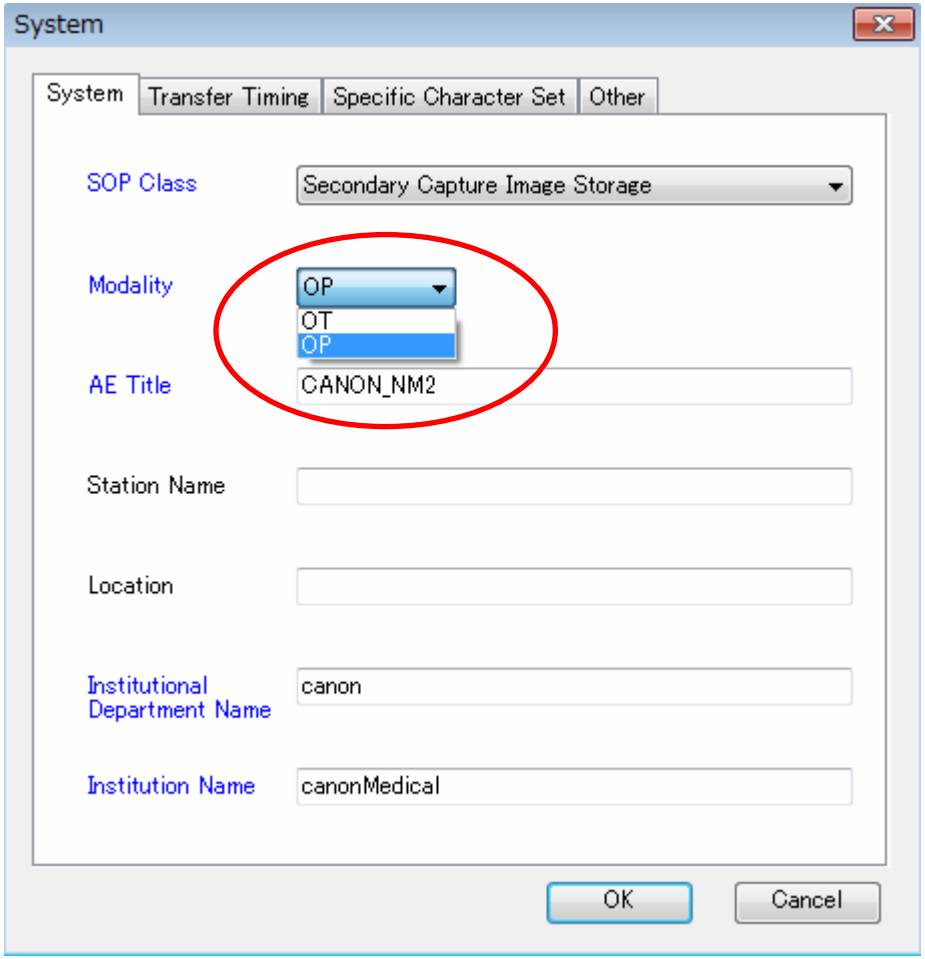
Change to SC Modality



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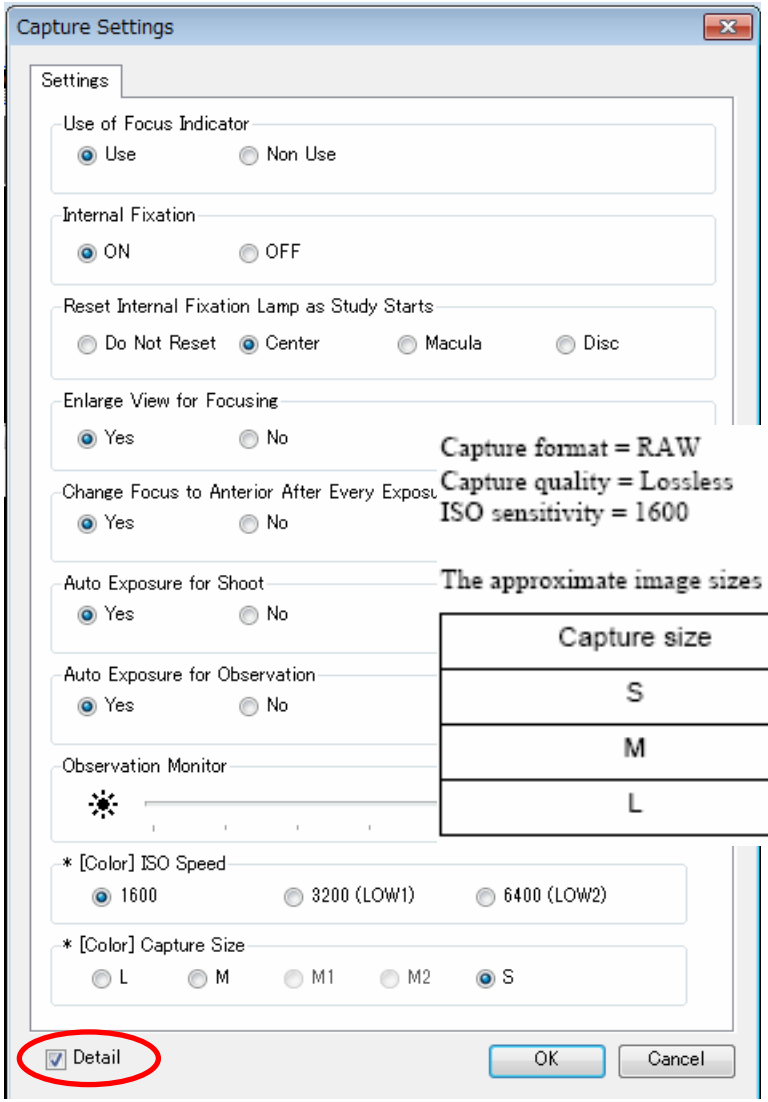
Saving in JPEG or Lossless Format



Capture format = RAW
Capture quality = Lossless
ISO sensitivity = 1600

The approximate image sizes for the above conditions are shown in the table below.

Capture size	Saving format = JPEG	Saving format = Lossless
S	400-600 kilobytes	10 megabytes
M	680 kilobytes	18 megabytes
L	1500 kilobytes	40 megabytes

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Study delete log and Study import log

A log of the deleted studies is saved for use in analysis when a problem occurs.
• Study delete log output location
The study delete log is saved to the folder (Installation folder)\Logs\DeleteStudy.
The file name is “yyyyMMdd.log”. yyyyMMdd is the date that the log was saved.

A log of the imported studies is saved for use in analysis when a problem occurs.
• Study delete log output location
The study delete log is saved to the folder (Installation folder)\Logs\ImportStudy.
The file name is “yyyyMMdd.log”. yyyyMMdd is the date that the log was saved.

```
[11:40:01] Delete Study Start
[11:40:01]  Delete Study Start [9]
[11:40:01]   PatientID=500, PatientName=
[11:40:01]   Number of images (3)
[11:40:01]    113817-000017.DAT
[11:40:01]    113823-000018.DAT
[11:40:01]    113909-000019.DAT
[11:40:01]  Delete Study End [9]
[11:40:01] Delete Study End
[12:58:37] Delete StudyList Start
[12:58:37]  Number of studies (3)
[12:58:37]  Delete Study Start [10]
[12:58:37]   PatientID=100, PatientName=
[12:58:37]   Number of images (1)
[12:58:37]    125751-000020.DAT
[12:58:37]  Delete Study End [10]
[12:58:37]  Delete Study Start [11]
[12:58:37]   PatientID=200, PatientName=
[12:58:37]   Number of images (1)
[12:58:37]    125803-000021.DAT
[12:58:37]  Delete Study End [11]
[12:58:37]  Delete Study Start [12]
[12:58:37]   PatientID=30, PatientName=
[12:58:37]   Number of images (3)
[12:58:37]    125813-000022.DAT
[12:58:37]    125816-000023.DAT
[12:58:37]    125818-000024.DAT
[12:58:37]  Delete Study End [12]
[12:58:37] Delete StudyList End
```

```
[10:15:00] Import Study Start
[10:15:00]  Number of studies (2)
[10:15:00]  Import Study Start [1.2.392.200046.100.3.8.0.26.20100508091733]
[10:15:00]   PatientID=500, PatientName=
[10:15:00]   Path=C:\Temp\20100508091731_8_000000_0026
[10:15:00]   Number of images (1)
[10:15:01]    C:\Temp\20100508091731_8_000000_0026\091733-000071.DAT
[10:15:01]  Import Study End [1.2.392.200046.100.3.8.0.26.20100508091733]
[10:15:01]  Import Study Start [1.2.392.200046.100.3.8.0.23.20100508091456]
[10:15:01]   PatientID=200, PatientName=
[10:15:01]   Path=C:\Temp\20100508091454_8_000000_0023
[10:15:01]   Number of images (3)
[10:15:01]    C:\Temp\20100508091454_8_000000_0023\091455-000051.DAT
[10:15:01]    C:\Temp\20100508091454_8_000000_0023\091459-000052.DAT
[10:15:02]    C:\Temp\20100508091454_8_000000_0023\091500-000053.DAT
[10:15:02]  Import Study End [1.2.392.200046.100.3.8.0.23.20100508091456]
[10:15:02] Import Study End
```

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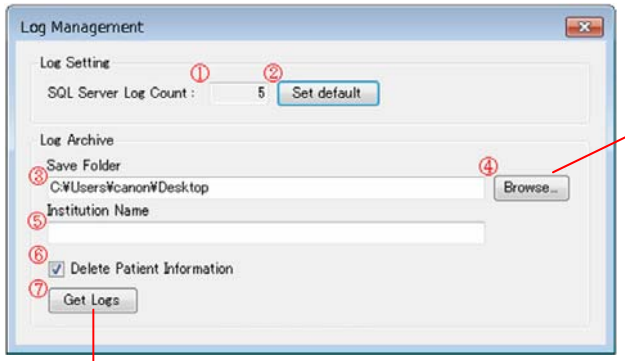
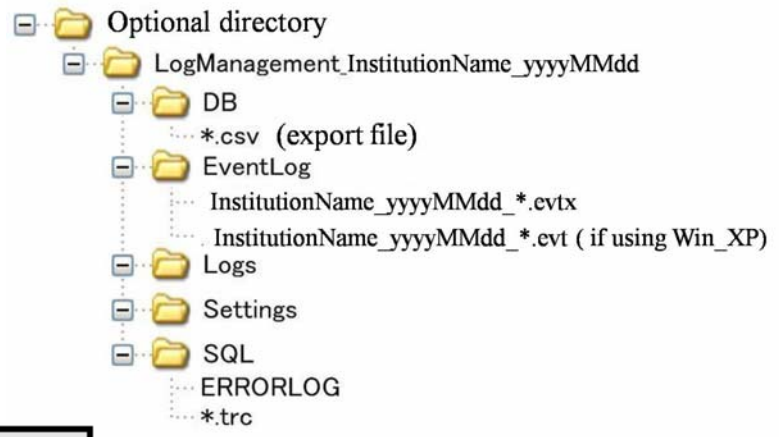
Log Management Tool (LogManagement)

File name	Description
LogManagement.exe	Tool program file
LogManagement.log	Log file (Automatically created when tool is executed)





Item	Header
Event Log	InstitutionName_yyyyMMdd
SQL Server	SQLServer_
SQL User Instance	SQLUserInstance_username_

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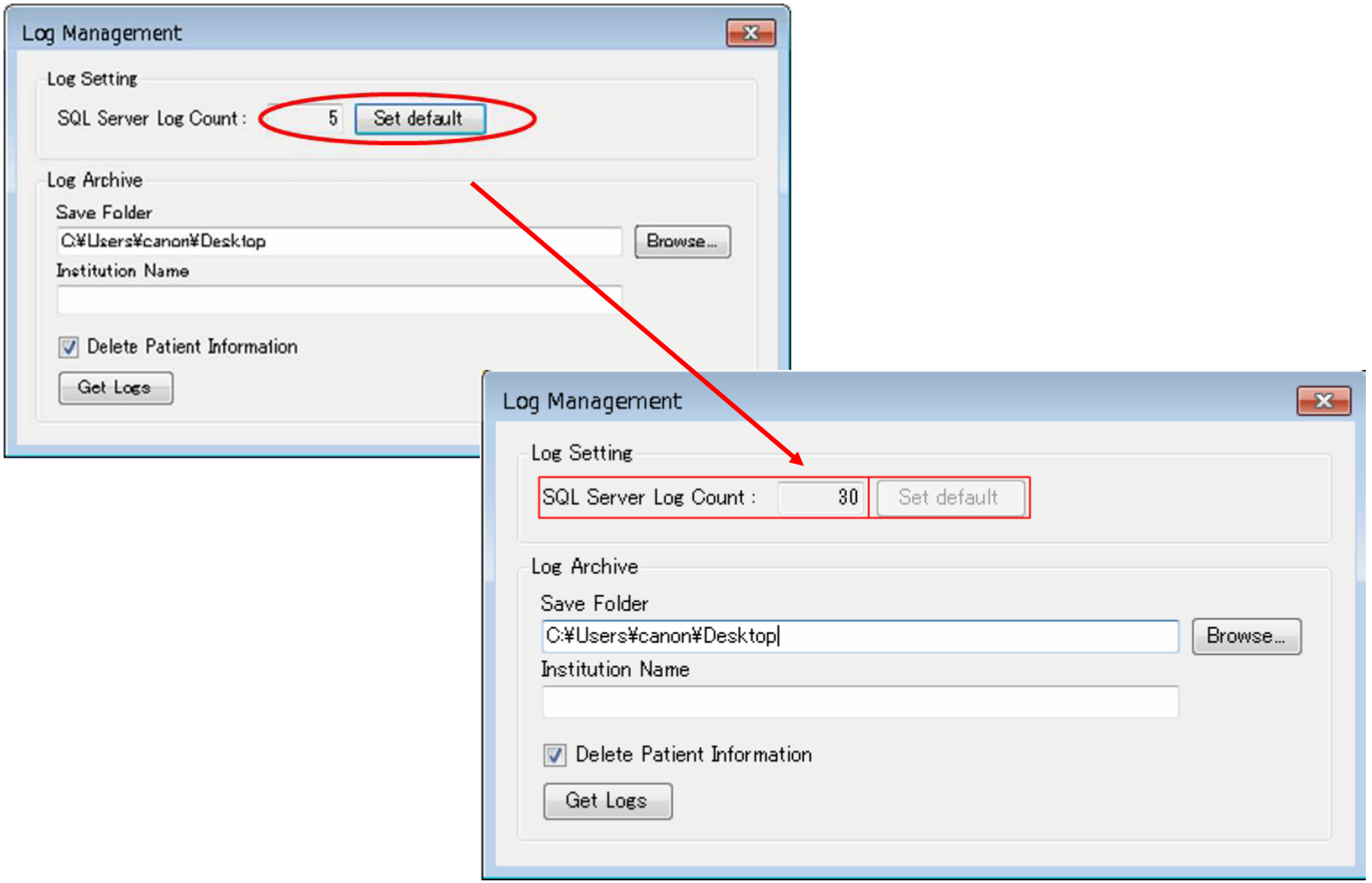
Changing the Number of Saved SQL Server Logs



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Modify UI of C/D screen

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Hands-on session

IMPORTANT!
Make x, y and z axes markings before removing any optical component.

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